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ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS

RESULTS OBTAINED BY TWENTY-FOUR AMERICAN OBSERVERS

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CHICAGO

American experience with the artificial pneumothorax treatment of pulmonary tuberculosis dates from 1898, when Dr. John B. Murphy[1] of Chicago described the new method and reported five cases in his oration on "Surgery of the Lung" before the Forty-Ninth Annual Session of the American Medical Association in Denver.

Previous to that, in 1882, unknown to Dr. Murphy, Dr. Carlo Forlanini of Pavia, Italy, suggested the method, following this by years of experimental work, and reported his first case of cure of an advanced unilateral case in 1895. During the last twenty years, Forlanini applied the method in a large number of cases.

The popularization of the method followed the publication, beginning in 1906, of an immense amount of experimental and clinical work by L. Brauer of Marburg, and his associates, L. Spengler and others. The introduction, in 1907, by C. Saugman[2] of Christiania, of the water manometer, for determination of the pleural space, rendered the method safer, and greatly stimulated its rapid adoption in Europe, the United States and other countries.

Following Dr. Murphy's brilliant exposition of the subject in 1898, his associate, Dr. A. F. Lemke,[3] continued the work under his direction, reporting, in 1899, fifty-three cases.

In studying these cases, I find that two were apparently in the first stage, twenty-five (or 47 per cent.) in the second, and twenty-six (or 49 per cent.) in the third. In forty-three cases (or 81 per cent.), the involvement was apparently unilateral; in ten cases (or 19 per cent. of the total), bilateral. Presence of cavities is indicated in only four cases; twenty-two, or 41.5 per cent. were febrile cases; hemorrhage was indicated in four cases. From one to five injections were given in fifty-one cases, a larger number in one case. The amount of nitrogen gas used was from 100 to 125 cubic inches in one third of the injections; from 110 to 148 cubic inches in half of the number. The shortest interval between injections was sixteen days; in 37 per cent. from three to four weeks, and in another 37 per cent. from four to five weeks. No manometer was in use at that time. The immediate results of treatment are given in fifty cases, after a period of observation from four to six months. Ten patients were sent west. Pleural effusion occurred in three cases; gas embolism with permanent hemiplegia in one case, and spontaneous pneumothorax with death in another.

Translating carefully the results given by Dr. Lemke, in fifty cases, into terms in use at present by the National Association for the Study and Prevention of Tuberculosis, we get the following figures: quiescent, four cases, or 7.5 per cent.; unimproved or worse, eight; improved, twenty-six cases, or 49 per cent.; deaths, two; sent to other climates, ten.

The untimely death of Dr. Lemke prevented the continuance of his work and publication of the subsequent results.

Following the introduction of the method by Dr. Murphy and his associate, the use of nitrogen gas compression was tried by several men in this country, notably at the Loomis Sanatorium, Liberty, N. Y., and other places. Various considerations, particularly the complications occurring in the course of treatment, led soon to the discontinuance of the work for a number of years.

Since the publication of the report of Dr. Brauer's work, the method was reintroduced in this country in 1910, among the pioneers being Robinson, Floyd and Balboni of Boston, Hamman and Sloan[4] of Baltimore, Mary Lapham of North Carolina and others. The method has grown in favor, particularly in the last three years, this paper presenting an analysis of the results of work, in this period of time, by twenty-four American observers. The results reported by them furnish a sufficient basis for the estimate of the efficacy of the method.

In many of the papers which I have studied, certain data are missing, and there is a variation in nomenclature, this rendering absolute exactitude of comparison impossible and necessitating conservative personal interpretation. I made a careful effort, by thorough study of reports of individual cases, to bring uniformity, in the designation of the results of treatment, in accordance with the scheme used by the National Association for the Study and Prevention of Tuberculosis.

The work analyzed in this paper represents the collective experience of a large number of hospital and sanatorium men all over the country, who during the

1. Murphy, J. B.: Surgery of the Lung, THE JOURNAL A. M. A., July 23, 1898, p. 151; July 30, p. 208; August 6, p. 281; August 13, p. 341.

2. Saugman, Christian: Internat. Centralbl., January, 1914.

3. Lemke, A. F.: Report of Cases of Pulmonary Tuberculosis, Treated with Intrapleural Injections of Nitrogen, with a Consideration of the Pathology of Compression of a Tuberculous Lung, THE JOURNAL A. M. A., Oct. 14, 1899, p. 959; October 21, p. 1023; October 28, p. 1077.

4. Hamman, L., and Sloan, M. F.: Bull. Johns Hopkins Hosp., February, 1913.

last several years have given considerable study to the subject.

CLASS OF CASES TREATED

Of 1,145 cases reported, the stage of disease is given in 1,028. Of this number 912, or 88.7 per cent., were in the far advanced stage; 109, or 10.6 per cent., moderately advanced; seven, or 0.7 per cent., incipient; five were cases of bronchiectasis; five pulmonary abscess; one tumor.

As shown in Table 1, the side involved is designated in 897 cases out of 1,145, or 78 per cent. of the total; bilateral involvement was present in 691 cases, or 77 per cent.; unilateral, in 206 cases, or 23 per cent. Presence or absence of cavities is given in 606 cases, or 53

TABLE 1.—RESULTS OF TREATMENT OF 1,145 CASES OF PULMONARY TUBERCULOSIS BY TWENTY-FOUR AMERICAN OBSERVERS

Name	Number	Stage	Involvement Bilateral	Involvement Unilateral	Number Cases with Cavities	Number with Tuberculous Complications	Satisfactory Compression	Partial Compression	Results of Treatment: Failure (Adhesions)	Unimproved	Improved	Quiescent	App. Arrested or Arrested	Cured	Dead
1. Von Adelung[5]	42	42, III	41	1	..		..	..	5	10	26	..	1 (or "cure")	..	..
2. Balboni[6]	70	Most, III	..	..	..		21	31	10	14	16	6	6	..	18
3. Barnes and Fulton[7]	17	17, III	17	..	7		10	6	..	5	5	1	..	..	6
4. Burns[8]	26	1, II; 18, III; 1, bronchiectasis	1	19	7	4 larynx	15	5	6	3	7	6	..	..	4
5. Chadwick[9]	43	3, II; 31, III	25	9	..		..	..	..	10	22	..	..	..	2
6. Dunham and Rockhill[10]	20	Most, III	19	1	10		..	..	4	..	14	2	..	..	..
7. Fehleisen and Rothschild[11]	44	.....	..	..	..		..	..	2	7	33 "good results"	..	..	..	1
8. Floyd[12]	28	3, II; 25, III	..	..	..		..	..	..	1	20	..	6	..	1
9. Gray[13]	145	11, II; 134, III	90	55	135	19 larynx, 14 bowel	97	48	..	40	37	..	22 (or quiescent) ("working")	..	46
10. Harris[14]	34	.....	20	14	..		19	12	3	1	9	..	17	..	4
11. Kessel and Taschmann[15]	29	2, II; 27, III	23	5	13	2 larynx, 1 bowel	17	9	3	6	9	10	..	..	1
12. King and Mills[16]	16	15, III; 1, abscess	15	1	6	6 larynx	..	..	6	3	2	2	..	..	3
13. Kingsley[17]	8	8, III	8	..	..		..	..	..	..	..	1	..	..	0
14. Lapham[18]	67	17, II; 48, III	49	18	48	5 larynx, 5 bowel, 1 gangrenous lung, 3 effusion, 9 empyema	41	17	5	2	1	1	18	11	29
15. Lyon[19]	74	4, I; 38, II; 32, III	62	12	..		..	..	18	31	22	..	..	..	3
16. Matson[20]	41	1, I; 2, II; 34, III; 3 bronchiectasis; 1 abscess	33	8	14	1 gangrenous lung, 5 larynx, 1 bowel, 3 effusion	18	11	4	5	9	13	3 ("apparently well")	..	7
17. Montgomery and Speese[21]	12	1, I; 1, II; 10, III	8	4	..	2 larynx	..	..	..	5	2	1	..	1 "well"	3
18. Mace[22]	34	6, II; 28, III;	34	..	24		..	..	4	4	7	..	7	3	9
19. Sachs	74	20, II; 52, III; 1 abscess	30	44	33	4 larynx	42	17	11	11	27	10	..	..	5
20. Schwatt[23]	60	57, III; 1 abscess; 1 bronchiectasis	53	6	55	19 larynx, 1 middle ear, 1 bladder, 1 spine	18	22	21	21	8	5	10	..	4
21. Schaye[24]	45	Most, III	..	..	..		21	18	6	..	..	8	..	..	8
22. Shortle and Peters[25]	110	1, I; 5, II; 104, III	90	11	..	In 37 cases: 2 bowel, 2 larynx, 1 pericardium	71	9	30	14	19	17	12	..	18
23. Voorsanger[26]	14	3, III	..	..	..		..	..	2	..	5	..	3	..	3
24. Webb, Gilbert, James and Havens[27]	83	81, (?) III; 1 abscess; 1 tumor	54+	..	25		..	..	21	10	23	28 "remarkable improvement"	..	1 (abscess)	2

5. Von Adelung, Edward: Induced Pneumothorax, THE JOURNAL A. M. A., June 20, 1914, p. 1944.
6. Balboni, G. M.: Boston Med. and Surg. Jour., Nov. 5 and Dec. 24, 1914.
7. Barnes, H. L., and Fulton, F. T.: Boston Med. and Surg. Jour., June 12, 1913.
8. Burns, E. H.: New Mexico Med. Jour., January, 1915.
9. Chadwick, H. D.: Boston Med. and Surg. Jour., Sept. 17, 1914.
10. Dunham, Kennon, and Rockhill, C. S.: Therapeutic Pneumothorax as a Palliative Measure, Safeguarded by Stereoroentgenograms, THE JOURNAL A. M. A., Sept. 13, 1913, p. 826.
11. Fehleisen, F., and Rothschild, M.: Experience with Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis, California State Jour. Med., September, 1913, xi, 343.
12. Floyd, C.: Some Results of Dispensary Work in the Control of Tuberculosis, Boston Med. and Surg. Jour., 1913, clxviii, 43.
13. Gray, E. A.: Illinois Med. Jour., October, 1913, supplemented by personal communication.
14. Harris, S. T.: Jour. Med. Assn. Georgia, August, 1912.
15. Kessel, Leo, and Taschmann, Max: A Study of Twenty-Nine Cases of Advanced Pulmonary Tuberculosis Treated by Artificial Pneumothorax, Arch. Int. Med., August, 1914, p. 210.
16. King, H. M., and Mills, C. W.: Am. Jour. Med. Sc., September, 1913.
17. Kingsley, C. R., Jr.: New York Med. Jour., Sept. 26, 1914.
18. Lapham, M. E.: Am. Jour. Med. Sc., April, 1912, supplemented by personal communication.
19. Lyon, J. A.: Boston Med. and Surg. Jour., Sept. 17, 1914.
20. Matson, R. C.: Northwest Med., January and August, 1914.
21. Montgomery, C. M., and Speese, J. F.: Pennsylvania Med. Jour., February, 1914.
22. Mace, L. S.: Report of Thirty-Four Cases of Artificial Pneumothorax, THE JOURNAL A. M. A., March 13, 1915, p. 897.
23. Schwatt, H.: Tr. Eleventh Annual Meeting, National Association for the Study and Prevention of Tuberculosis.
24. Schaye, Milton: Artificial Pneumothorax, THE JOURNAL A. M. A., March 21, 1914, p. 900.
25. Shortle, A. G., and Peters: New Mexico Med. Jour., January, 1915, supplemented by personal communication.
26. Voorsanger, W. C.: Palliative Effect of Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis, THE JOURNAL A. M. A., May 9, 1914, p. 1450.
27. Webb, G. B.; Gilbert, G. B.; James, T. L., and Havens, L. C.: Tr. Tenth Annual Meeting, National Association for the Study and Prevention of Tuberculosis.

per cent. of the total. Of the 606 cases, cavities were present in 378, or 62 per cent. The presence of tuberculous complications is given in 489 cases, or 43 per cent. of the total. The number of tuberculous complications was 112, or 23 per cent. of the 489 cases in which complications were recorded. Of the 112 complications, sixty-eight involved the larynx, twenty-three the bowel, and fifteen were either empyemas or pleural effusions.

It is apparent from the large proportion of far-advanced cases, 88.7 per cent. (with bilateral involvement present in 77 per cent., cavities in 62 per cent., and serious tuberculous complications in 23 per cent.), that artificial pneumothorax is being tried at present in this country chiefly in very advanced cases unimprovable under ordinary sanatorium regimen. This must be taken into consideration in judging the "immediate" and "subsequent" results obtained in 1,145 cases analyzed in this paper.

The degree of compression obtained in individual cases, as judged by physical signs and subsidence of constitutional disturbance (in some by Roentgen-ray plate and fluoroscope), is given in 757 cases, or 66 per cent. of the total number reported. Of this number, satisfactory compression was obtained in 390 cases, or 51.5 per cent.; partial, in 205, or 27 per cent.; failure, in 162, or 21.5 per cent.

IMMEDIATE RESULTS

The results of treatment, as given in 1,108 cases (out of 1,145), can be designated as in Table 2.

TABLE 2.—SUMMARY OF RESULTS OF TREATMENT IN 1,108 CASES REPORTED BY TWENTY-FOUR AMERICAN OBSERVERS

	No.	Per cent.			No.	Per cent.	
Failure (failure 152, very small amounts 10)	162	14.6	49.1%	Improved	323	29.2	21.7%
Unimproved	203	18.3		Quiescent	119	10.8	
Dead	180	16.2		A p p. arrested (or arrested)	105	9.5	
				Cured	16	1.4	

Sixty-nine, or 6.2 per cent., were working.

As in over 90 per cent. of these cases the result was recorded either during the course of treatment or a few months after its discontinuance, and in only 10 per cent. from a few months to three years after discontinuance, the results should be designated as "immediate."

The method was unproductive of *any* beneficial effect in almost half of the cases (failures, unimprovements and deaths amounting to 49.1 per cent.); 29.2 per cent. were "improved," the improvement being, probably, of limited duration in the majority of these cases; 21.7 per cent. is the total of the "quiescent," "arrested" and "cured" cases.

Thus the *immediate* beneficial result of artificial pneumothorax treatment of these 1,108 cases was mostly palliative in 29.2 per cent. and *apparently* durable in 21.7 per cent.

A comparison of the results obtained by the American observers with the results recorded in 224 cases by Brauer, Spengler and Zink,[28] after a period of observation extending from six months to five years, is given in Table 3.

The total percentage of failures, unimprovements and deaths in the American cases was 49.1, as compared with 42.9 in the cases reported by Brauer, Spengler and Zink. It is apparent that with the class of cases selected at present for artificial pneumothorax, the method is either inapplicable or is unproductive of *any* beneficial effect in almost half of the cases.

Most of the "improvements" (American 29.2 per cent.; Brauer, Spengler and Zink, 31.2 per cent.) can be classed under the head of "palliative effect."

The group of "quiescent" cases (American 10.8 per cent.; Brauer, Spengler and Zink, 9.8 per cent.) includes, in all probability, a proportion of "durable results," a term which can be unequivocally applied only to almost all the "arrested" or "cured" cases (American 10.9 per cent.; Brauer, Spengler and Zink, 16.1 per cent.).

SUBSEQUENT COURSE OF ARTIFICIAL PNEUMOTHORAX CASES

The efficacy of artificial pneumothorax treatment can be judged only by the subsequent course, through a long period of years, of a large number of cases. In studying the American literature and some of the European, I was unable to gather any voluminous data bearing on this important question. Some figures of interest are given in Tables 4 and 5.

It may be a conservative estimate to say that, with the present technic and the class of cases treated, the percentage of durable results ("arrests" or "cures") is about 12 per cent., while in more than double this number (29.2 per cent. of 1,108 cases analyzed in this paper), a palliative effect is produced, which is of variable duration. The sum total is a distinct increase of the chances of the advanced case which does not respond to the usual methods of treatment.

28. Zink: Internat. Centralbl. f. d. ges. Tuberk.-Forsch., January, 1914.

TABLE 3.—COMPARISON OF RESULTS OBTAINED BY AMERICAN AND SOME EUROPEAN OBSERVERS

	American Observers			European				
	No.	Per cent.		Zink (Observed Six Months to Two Years) No.	Brauer and Spengler (Six Mos. to Five Yrs.) No.	Total No.	Per Cent.	
Cases	1,108			110	114	224		
Failure	.....	14.6	49.1	29	26	55	24.6	42.9
Unimproved	.....	18.3		16	6	22	9.8	
Dead	.....	16.2		("worse") (number dead?) 34	19	19	8.5	
Improved	.....	29.2			36	70	31.2	
Quiescent	.....	10.8	21.7	22 ("working")	...	22	9.8	25.9
Arrest or cure	.....	10.9		9 (cured or working)	27	36	16.1	

SELECTION OF CASES FOR ARTIFICIAL PNEUMOTHORAX

Various problems enter into the consideration in the selection of cases for artificial pneumothorax.

1. In less than one third of far-advanced cases (29.2 per cent. of "improvements" in the 1,108 cases reported by American observers), the effect is chiefly palliative, slightly or markedly, lasting a variable period of time.

In the same class of cases, only slightly more than half of the immediate "apparently" durable results (21.7 per cent. of quiescent, arrested or cured cases out of a total of 1,108 analyzed in this paper) stand the test of time as shown by the smaller percentage of 12.3 in cases under observation from a few months to seven years after "reexpansion" (Table 5).

2. A free pleural space is essential in the attainment of "satisfactory compression" (effective pneumothorax). In far-advanced cases, similar to the 1,108 analyzed in this paper, the pleural space is usually completely obliterated in about 20 per cent. and partially in more than 30 per cent.

consideration of lung compression. Numerous factors will determine the decision, such as rapid extension of the process, marked constitutional disturbance and rapid impairment of the general condition, etc. The preliminary observation of the cases should be thorough, by the use of all the clinical and laboratory methods and with the aid of Roentgen examinations.

It is the gradually forming consensus of opinion among the majority of observers that the best results can be obtained before the occurrence of extensive adhesions, marked involvement of the opposite lung and the irreparable deterioration of the general resistance.

DANGERS AND COMPLICATIONS INCIDENT TO THE PRODUCTION OF ARTIFICIAL PNEUMOTHORAX

With the gradual perfection of technic and a more careful selection of cases, accidents occurring in the course of pneumothorax treatment are gradually diminishing in number. Nitrogen gas should never be permitted to enter until the manometer establishes the connection with the free pleural space, by sustained

TABLE 4.—SUBSEQUENT COURSE OF CASES OBSERVED FROM ONE-HALF TO SEVEN YEARS

	No. Cases	Failure	Unimproved	Dead	Improved	Quiescent	Arrest or Cure
Balboni (a few months to 3½ years)	70	10	14	18	16	6	6
			60%			17.1%	
Brauer and Spengler (½ to 5 years)	114	26	6	19	36		27
			44.7%				23.7%
Saugman (½ to 7 years)	200	.....			5		15
Total	384					Average 14%	

TABLE 5.—SUBSEQUENT COURSE OF "REEXPANSION" CASES (OBSERVED FROM THREE MONTHS TO SEVEN YEARS)

	Total No. Cases	Treatment			Present Condition of Reexpansion Cases			
		Reexpansion	Suspended	Active	Improved	Quiescent	Arrest	Cure
Balboni	70	17	8 months to 3½ years	3	3	5	6	..
Saugman	200	30	½ to 7 years	..	5			15
Lapham	67	14	A few mos. to 4 years	..	..	14 ("excellent condition")		..
Shortle	110	15	A few mos. to 2½ years	..	..	15 ("working")		..
Total	447	76		3	8	55 or 12.3 per cent. of the total		

A comparison of sixty-six "partial compression" cases, with 153 cases in which satisfactory compression was obtained (out of the American series, Table 1), gives, in the "immediate" results, 18.2 per cent. of quiescent and arrested cases for the "partial compression" group, and 47 per cent. of same results in cases with satisfactory compression.

3. The condition of the opposite lung is of vast importance in the attainment of durable results. Comparing the "immediate" results of artificial pneumothorax treatment in ninety-one unilateral cases and 162 bilateral, out of the series of cases by American observers, we find that the percentage of unimprovements and deaths in unilateral cases was twelve, in bilateral cases forty-three; the percentage of quiescent and arrested cases was 50.5 in unilateral and 24.7 in bilateral.

4. Failure of progressive cases of pulmonary tuberculosis to respond to sanatorium methods of treatment (absolute rest, open air, etc.), after a sufficient period of trial, should be the basis, regardless of stage, for

negative pressure and free oscillations. Asepsis is another important factor. Local anesthesia of the entire needle track is insisted on by many observers for the prevention of pleural shock. Excessive pressure within the pleural cavity should always be avoided. Even positive pressure is not entirely necessary for the production of effective compression. An important exception should be made in cases of severe hemorrhage, in which bleeding persists until a marked positive pressure is established. The method should never be employed in the presence of severe cardiac complications.

Saugman reports fourteen serious mishaps and one death in a series of ninety-eight cases and 2,000 punctures, in his early experience, in the period from 1906 to 1910. From 1910 to 1912, he had two mishaps and one death in sixty-three cases and 1,200 punctures. Since 1912, with more careful technic, he reports no mishaps, in forty-nine cases and 2,000 punctures. This has reference chiefly to pleural shock and air embolism.

Pleural effusion, the most frequent complication in the course of artificial pneumothorax, is variously ascribed to infection, to progressive irritability of the pleura, caused by trauma, to slowing of lymphatic circulation in the compressed lung, to the breaking of tubercle through the pleural surface, etc. The frequency of its occurrence, in the experience of some observers, is dependent on the extent of the process and duration of treatment. Strict asepsis and careful technic may be a considerable factor in its prevention. At present, its incidence is estimated at from 30 to 50 per cent.

Of 784 cases, reported by fifteen American observers, who recorded in their reports the frequency of this complication, pleural effusion occurred in 113, or 14.4 per cent., of the total number of cases. The small percentage may be due to the inclusion of a large number of cases reported in the early period of treatment and omission of small effusions, the presence of which can be ascertained only by frequent physical and Roentgen examinations.

There is considerable difference of opinion as to the effect of effusion on the further progress of a case treated by gas compression. While improvement does occur in a certain percentage of cases, occurrence of effusion is regarded by most experienced observers as a complication affecting the future outlook of a case. This is borne out by the frequent occurrence of adhesions preventing future compression and frequent extension of the process in the opposite lung. We are in need of more comprehensive data on this subject.

Gas embolism is a rare incident in pneumothorax therapy. Its onset is sudden. The manifestations vary from temporary unconsciousness, convulsions, temporary hemiplegia and gradual recovery, or fatal termination in a few hours to two or three days, to the gravest form, in which a severe coma without any preliminaries results in almost instant death.

The air or gas may come through the needle, from the lung (cavity) or pleural space. The pulmonary veins, because of the negative pressure in these vessels, present the most favorable condition for the entrance of gas. The incident is more frequent when pleural adhesions are penetrated by the needle, the gas being introduced through one of the veins into the circulation (Brauer). Fatal termination results from the final lodgment of air or gas in the coronary arteries or vessels of the brain (Saugman). According to Wolff-Eisner, thrombi are responsible for some of the incidents described under the head of air or gas embolism.

It is agreed that this grave incident is almost impossible with intelligent interpretation of manometer findings (sustained negative pressure and wide oscillations).

According to Matson, "this accident should belong to the first historic period of pneumothorax therapy."

In Saugman's experience, one death occurred between the years 1906 and 1910 (with ninety-eight patients and 2,000 punctures); between 1910 and 1912, one death (sixty-three patients and 1,200 punctures); between 1912 and 1914, with more careful technic (forty-nine patients, 2,000 punctures), no mishaps.

Reports of this rare but grave incident are scattered over the European literature (Brauer, four cases; Saugman, 2; Zink, 1, etc.). Forlanini encountered the accident four times in 10,000 operations (two fatal).

Of 1,058 cases treated by twenty-two American authors, three incidents of gas embolism occurred in a group of 191 cases reported by three authors, while 867 cases, treated by nineteen authors, were free from the incident. The latter group includes seventy-four cases treated by the author (700 injections).

The incidents described, in the American and European literature, under the name of *pleural shock* (pleural reflex or eclampsia) vary from slight manifestations of faintness to disturbances of various degrees of the circulatory, respiratory and nervous motor and sensory systems. With few exceptions, the manifestations, as given, are mild, of passing nature and with no after-effects. A few fatal terminations were recorded by European observers.

The present tendency (particularly Brauer) is to ascribe many of the grave manifestations included under "pleural reflex or shock" to "gas embolism."

The mechanism of production of pleural reflex is given by Russell[29] as follows: "afferent impulses conveyed to medulla along vagus, whose terminal fibers rendered unduly sensitive by compression, or inflammation are irritated by the needle." Death is generally ascribed to spasm of cerebral or cardiac vessels.

Anesthesia of the needle track (novocain from 0.5 to 1 per cent., epinephrin 1:10,000) through the skin, the underlying tissues and pleura, is urged by most observers as a preventive of this complication, and yet the incident was absent in groups of cases treated without any anesthesia (E. A. Gray, 145 cases, 1,200 injections; myself, seventy-four cases, 700 injections, and others).

Saugman reports one case of pleural shock in 104 cases (paralysis of heart; death); Forlanini, twelve occurrences in 134 patients, 10,000 injections.

Of the 1,058 cases in the American literature, analyzed in this paper, pleural shock occurred twenty-six times, or in 2.5 per cent. of cases. There were no fatalities.

Of the 1,122 cases reported by twenty-four American observers in the last two years or more, the incidence of various complications, occurring in the course of treatment, was as given in Table 6.

TABLE 6.—COMPLICATIONS REPORTED BY AMERICAN OBSERVERS

Complications	No.
Pleural effusion	113
Extension of process in opposite lung	58
Bleeding of other lung	7
Pleural shock	26
Gas embolism	3
Spontaneous pneumothorax	10
Bilateral pneumothorax	2
Pyopneumothorax	13
Cardiac dilatation and heart failure	4
Torsion of heart and blood vessels	1
Total	237*

* Twenty-one per cent. of the total number of cases.

CONCLUSION

Experience with artificial pneumothorax in the treatment of pulmonary tuberculosis is gradually modifying the sphere of its application. The trend is toward its use, regardless of stage, in all progressive cases (particularly with unilateral involvement) which fail, after sufficient trial, to respond to strict sanatorium regimen.

Complications incident to the employment of this method, the great importance of continuous strict observation and thorough clinical, laboratory and Roentgen study of each individual case, the rest periods essential after each reinflation, the inability

29. Russell, quoted by Fishberg, M.: Med. Rec., New York, Jan. 2, 1915.

of outlining in advance the time of reinflations, in short, the close dependence of each successive step in pneumothorax therapy on the varying condition of the patient, are all factors which call, in the majority of cases, in the interest of safety and best results, for hospital or sanatorium supervision, at least for a few months, of each individual case in which the method is being applied. Close attention to every important detail of technic, as well as strict asepsis, is also less of a problem, under such conditions, regardless of the excellent results obtained by some observers, in dispensary and office practice.

The present tendency, grown out of experience, is toward greater conservatism in the selection of cases, a selection based on thorough preliminary study and full consideration of the possible effect of compression in the individual case. Conservatism needs to characterize each successive step in the gradual attainment and subsequent maintenance of a satisfactory compression, with avoidance of too frequent reinflations and excessive intrapleural pressure. This attitude is very important, with a method the application of which cannot be subject to rule but is dependent on the condition of each individual case.

Through improvement of various details of technic and greater conservatism of action, pneumothorax therapy is gradually finding its defined place in the treatment of cases of pulmonary tuberculosis which do not yield to other methods.

25 East Washington Street.

LESIONS OF THE LUMBOSACRO-ILIAC REGION

A STUDY IN THE VARIOUS TYPES *

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SAN FRANCISCO

In asking your indulgence for a few minutes in the consideration of lesions involving the lumbosacral and the sacro-iliac articulation, I do so because of the importance of recognizing the underlying conditions as early as possible.

In an endeavor to understand the mechanism of the lumbosacral joint, with its many peculiarities, and the too frequently resulting strains to the sacro-iliac joints, it must be remembered that the lumbosacral joint is intimately associated with the sacro-iliac joint function.

Statistics, which I have gathered from my study of occupational or industrial diseases, show lesions of the lower back to be one of the most frequently occurring conditions.

Anatomic variations from the normal structure of the bones of this region are very common. Very often these anomalies do not become evident until excessive or repeated joint strain bring them under observation.

In the study of cases representing the various types, it is impossible to isolate a type as belonging to only one group. For a traumatized joint may later become the seat of an inflammatory process. An abnormal bone formation does cause a lateral curvature. Relaxed ligaments have produced a defective balance of the whole body. With this point in mind, however, namely, the interrelation of the different types, I have grouped these lesions into, first, traumatic, with or without anatomic variations; second, static; and third, toxic.

In the traumatic group are included cases in which injury is the principal factor. These lesions are further classified into, first, acute types, in which the trauma is recent and primary, and second, chronic, in which the trauma is recurrent and of longer duration.

In the acute types the lesion is unilateral, with or without bone displacement. It is the result of direct strain or indirectly through muscular action. In these cases, the sacro-iliac joint receives the entire force of the effort and the bony surfaces of the sacrum or the ilia may slip, or a rupture of the ligaments may occur.

These conditions are demonstrated when bending forward in the act of lifting a heavy object; or in jumping and giving the trunk a sudden twist on the pelvis; or when in swimming and diving, quick hyperextension of the lumbar spine occurs; or during childbirth, when instrumental interference is necessary; or during or following surgical operations with a general anesthesia.

The symptoms depend on the amount of injury rather than on the severity of the cause producing it. Pain usually accompanies the injury. It is sharp and lancinating in character and is increased by all motions. It is present about the affected joint or is referred up the back, over the buttocks, or down the leg. Deformity shows as a forward stoop, a list to one side or flexed leg at hip. Regular tests demonstrate all motions limited. The local signs are obliteration of the lumbar curve, tenderness, or very often, a slight bony prominence over the injured area. The Roentgen ray may show an anatomic variation or a displacement of one of the bones of the lumbosacro-iliac articulations.

In the chronic types, because of repeated strains, there is relaxation with occasional displacement. Adhesions are present. The lesion is unilateral although later involvement of the other sacro-iliac joint does take place. Cases vary considerably in character. For example, lesions may result from repeated movement of a broad transverse process of the fifth lumbar vertebra pressing on the ilium until a backward displacement of the sacrum on the opposite side is produced, as in wood chopping; or continual slipping of the flattened articulating processes of the fifth lumbar vertebra, as in automobile repairing; or too often sliding of articulating surfaces of sacrum and ilia on each other, as in marked relaxation of the joint; or subluxation of an intervertebral cartilage, as in repeated displacements of the lumbosacral joint.

The symptoms are intensified with each new strain. Pain may be slight or severe. Irritation of the lumbosacral nerves, after their emanation from the vertebral foramina, gives pain over buttocks, hip and down the leg. This is increased by standing or walking and is less severe after lying down. Deformity may show as a decided forward bending or list to one side with prominence of the hip on the opposite side. The lumbar spine is flattened. In many of these cases the deformity can be corrected, but relapse occurs if sufficient support is not used. Regular tests elicit limitation of motion only in certain directions. Locally, there is considerable tenderness over the affected joint. Referred pain can be started by pressure in this

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region. There is spasm of the muscles; movement of the joint is guarded and painful. The Roentgen ray usually demonstrates separation or displacement of bones of the joint. Bony anomalies likewise are thus discovered.

In the static group, faulty posture is the most striking feature presented. The muscles and ligaments and therefore the joints of the lumbosacro-iliac region are relaxed. The continual strain on these joints increases the lumbar curve and tilts the top of the pelvis forward. In the variation from the proper poise, the mechanics are disarranged and the physiologic functions of the body are disturbed. This type of lesion is usually bilateral.

A defective posture may result from general debility, which reduces the quality of the muscles and ligaments; or anatomic variations, which may cause a lateral curvature and later a scoliosis; or incorrect clothing, which may compress the trunk or give inadequate support; or lipomatosis or general increase in weight, which increases the strain on the muscles and ligaments of the pelvic girdle; or faulty foot or leg conditions which give unequal base of support; or pregnancy when relaxations of the pelvic joints are very marked; or certain occupations which require fixed positions; or sagging abdominal walls with the accompanying visceroptosis. The long, slender, loose-jointed type of individual, with few exceptions, makes up the greatest number of cases in this group.

The symptoms of the static type are easily recognized. The onset is gradual. The slumped or relaxed attitude in standing is marked. There is a general weakness in walking and standing rapidly causes fatigue. Patients cannot lie comfortably on the back, are restless at night, usually sleep on the side with the thighs flexed. Backache is most constant. Locally, tenderness over all the joints is found. There is always a lordosis, while the posterior back muscles are in a state of spasm. The regular tests show unusual mobility and relaxation of the joint. The Roentgen ray is useful in this group as a method of eliminating the other group types.

In the toxic group are found those types of cases in which the inflammatory element predominates. Continual irritation of the lumbosacral and the sacro-iliac articulation, usually with relaxation, produces a chronic congestion in this region and thus infection is easily started.

While tuberculous, syphilitic, typhoid and gonorrheal lesions frequently occur in this region, still infection, or toxins, primarily involving the nasal, oral, pharyngeal and gastro-intestinal tracts, produce a pathologic process — an osteo-arthritis — which demands much attention in diagnosis and prognosis. Extension of disease from the pelvis, or following gynecologic procedure, or obscure toxemias resulting from improper metabolism, gradually settle in this region and cause an arthritis.

The symptoms show the onset to be gradual, and secondary to inflammation or toxemia, present elsewhere in the body. When acute, the joints are swollen, the soft tissues are thickened and very tender. The condition is aggravated by standing, sitting or walking. The joints are extremely sensitive to any motion which will induce strain on the pelvic girdle. In the chronic cases, a burning, aching pain is experienced over the sacro-iliac area. Pain, usually dull in character but with sharp paroxysms, may be referred up the back, over the buttocks and hips, and down the posterior aspect of the leg to the heel. Frequently there is disturbance of sensation in the lower extremities. Posture does not relieve the pain. It is in this group of cases that narcotics are resorted to most often to overcome the pain. The deformity causes the patient to hold the lower back stiffly. A marked forward bending or a list to one side is present. There is no lumbar curve, but a prominence of the dorsal spine. The regular tests are usually restricted in every direction. Locally, the flat, rigid lumbar spine, the muscular spasm, the limited area of tenderness and the impossibility of attempted motion are observed. The Roentgen ray usually shows a pathologic process involving some part of the lumbo-sacro-iliac articulation.

In conclusion, I wish to state that differentiation of the various types is not difficult if one bears in mind the fact that in the traumatic group, injury with the sudden onset of symptoms is most important; in the static group, the defective posture with marked relaxation of the joints is present; and in the toxic group, the history of an inflammatory process with the tendency to fixation of the joints is found.

Surgical Division, Leland Stanford Junior University, School of Medicine.

ABSTRACT OF DISCUSSION

DR. C. C. CRANE, San Francisco: While I wish to elaborate somewhat on the anatomic variations to which Dr. Langnecker referred, I also wish to challenge his statement that "Posture does not relieve pain." Radiograms which I have show various mechanical faults which are productive of pain, deformity and disability. I have divided them into three classes: potential trouble makers, actual trouble makers and proximal trouble makers. The symptoms presented by the patients were various and numerous but all of them were relieved by conservative measures.

DR. FRED. J. FASSETT, Seattle: I think it would not be out of the way to have some one who has the facilities and the clinical material make a routine examination of a large number of normal adults, so that we may form some sort of an estimate as to how many people are going about with large transverse processes and other anatomic variations without any symptoms at all. Of course, it is only the ones with symptoms that come to the physician, and it seems to me that we have a very one-sided view of the subject thus far.

DR. LEONARD W. ELY, San Francisco: In the orthopedic department of Stanford University with a complete outfit and all the facilities to work with, we are entirely at sea on this subject of lumbo-sacro-iliac lesions. I have become discouraged trying to replace these so-called slipped joints —in trying to get the painful ones relieved—and we are ready and eager to put all the facilities that we have at the disposal of anybody who will undertake to help us clear this matter up. I have become discouraged, but a ray of hope, I may say, has broken on me from what Dr. Langnecker has said.

DR. J. T. RUGH, Philadelphia: In regard to Dr. Fassett's request, I had one of the leading roentgenologists in Philadelphia for the past six months make a study of the cases which came under his care for all abdominal conditions. He has told me, after looking over a series of probably four or five hundred of these cases, that he finds some anomalies in this part of the spine in a very large percentage of the cases. In fact he is coming to look on it as rather unusual to find the normal.

DR. JOHN RIDLON, Chicago: I should like to ask that in closing, Dr. Langnecker say whether in any of these strained or slipped joints—sacro-iliac or lumbosacral region—he has had anything in the nature of atrophy of the limb develop on the painful side.

DR. C. R. MCCLURE, Portland, Ore.: At present through the courtesy of Dr. Coffey's office in Portland we are having observations made on this region of the lower back, and I hope at some future meeting to make some reports concerning our study of this region. We see a great many of these cases, and, like many of the men here, I sometimes doubt the value of the Roentgen ray in a diagnostic way because of the frequency with which these anomalies are found in people who have no symptoms one way or the other.

DR. ROLAND MEISENBACH, Buffalo, N. Y.: That the pelvic joints, especially the sacro-iliac and sacrolumbar, are so frequently involved in the sciaticas and the backaches which are met with, can no longer be doubted. The results of the treatment for these conditions, with the relief given the patient, have spoken for themselves. I believe that the most important matter for our consideration in diagnosis is to differentiate between the sacro-iliac and the sacrolumbar lesions. It is true that in some we have both these joints involved; it must also be remembered that occasionally we may have backache due to the strain or injury to the sacrolumbar joint in a person who may have other conditions present; as, for instance, a very heavy person with leukemia may sustain an injury to the sacrolumbar joint due to the actual weight of the abdomen, and in relieving the strain we are naturally relieving but one of the symptoms. Another type of sacro-iliac and sacrolumbar lesion which is more frequently met with is one of trauma, in which there also exists pelvic inflammation, or glandular inflammation, which has attacked the pelvic joints or has weakened them so that they are subject to trauma. One has only to remember his anatomy and note the variations in the sacrolumbar joint, both as regards the articular processes and also the variations in the transverse process in different individuals. I have met many times a type of sacrolumbar lesion in which the patient has had recurrent backache, which I am sure has been due to a very shallow sacrolumbar articulation. In this type it has been sometimes difficult to illustrate the condition by means of a roentgenogram. In regard to the roentgenogram, I cannot agree with Dr. Langnecker. If he had used the word "occasionally" instead of "usually," I think it would have been more to the point. In cases with a long or thickened transverse process of the fifth lumbar vertebra, which may or may not articulate with the sacrum or ilium, or in cases in which the sacro-iliac joint has opened and the sacrum has dropped or tilted, it is not very difficult to illustrate by means of the roentgenogram; but those cases (and they are frequently met with) in which the sudden movement of the body may quickly incapacitate the individual, causing such a severe pain that the person is unable to take another step, are rather difficult to illustrate by means of the roentgenogram. I believe this type of case to be that of the shallow sacrolumbar joint, in which the joint articulations are of such construction that they easily become dislodged. Many of these do not seek relief at the first attack, but usually after having rested or having had several attacks. Also in the type of loose sacrum it is difficult to demonstrate by means of the roentgenogram; that is, the single flat plate will show nothing, but the stereoscopic roentgenogram will often show the sacrum slightly tilted. Dr. Langnecker has covered the ground of symptoms very well. One of the best illustrations of the severe sciatica which was caused by motion in the sacro-iliac joint is that of metastatic carcinoma of the sacrum following, as in the case I have presented, a removal of the breast for carcinoma. In this case, the slightest motion of the ilium on the side in which the sacro-iliac joint is involved causes a severe sciatica.

DR. C. L. LOWMAN, Los Angeles: We have a skeleton which shows an anomaly of the first sacral—just a small lateral process on one side, like a lumbar vertebra, the full length and width of ala on the opposite side, with a joint between it and the second sacral; an absolutely flat articular process on the right side, and a vertical process on the other. This allowed a great deal of rotation of the sacrolumbar segment forward around this vertical process as an axis, with a narrowing of the posterior foramina. Another similar case was presented to me by my radiographer. This case was treated by a chiropractor as a tuberculous spine. The roentgenogram showed an assimilation of the first sacral, which tried to be a lumbar on one side.

DR. H. L. LANGNECKER, San Francisco: In reply to Dr. Ridlon's question, I would say that in a great number of cases, especially those of the lumbosacral region, there seems to be an atrophy of the muscles of the anterior part of the thigh, the atrophy of the other muscles having been consistently noted.

DR. JOHN RIDLON, Chicago: By measurement?

DR. H. L. LANGNECKER: Yes, by measurement. It is one of the signs. These conditions are usually studied by stereoscopic roentgenograms; all the important ones were in my cases. I found that the study of this class of cases was extremely interesting. There is much, as yet, to be said about them. I can only repeat what one of the orthopedic surgeons—a man who has done more, probably, on lesions in the sacro-iliac region than anybody else in the country—told me. He said that there was a great deal yet to be known about lesions in this part of the body, and that he thought when the final verdict was given it would be an anatomic one.

LYMPHOID MARROW AND TUBERCULOSIS

AN EXPERIMENTAL STUDY *

LEONARD W. ELY, M.D.
SAN FRANCISCO

In a paper read before this section at its meeting in 1914, Mr. John Fraser made the statement that red marrow was immune or practically immune to tuberculosis. This statement was based on the results of attempted inoculation of the long bones of laboratory animals, whose marrow is of the red or lymphoid variety. The question is of great importance, and we have been conducting a series of experiments in the laboratories of the Stanford School of Medicine to test the accuracy of Mr. Fraser's conclusions.

Dr. John F. Cowan and I conducted one series, on which we shall report later. Dr. Jean Oliver and I conducted another series which I shall report here.[1]

The animals used were rabbits and guinea-pigs. With the former, bovine tubercle bacilli were employed (Cutter Laboratory bovine strain, K 9), with the latter, human bacilli from a virulent strain supplied by Dr. Hirschfelder. The animals were anesthetized with ether, and the limb to be operated was shaved. Strict asepsis was observed, a small incision was made in the leg, a trephine opening was made into the tibia, and with a hypodermic needle a few drops of a suspension of bacilli in normal salt solution were injected directly into the marrow. The wound was then sewed up with catgut and was painted with collodion.

At varying intervals before the operation and sometimes after it, a 1 per cent. solution of trypan blue was injected into the animals, 20 c.c. into the ear vein of the rabbits, and 2 c.c. subcutaneously into the

* From the Leland Stanford Jr. University Laboratory of Surgical Pathology.

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* Owing to lack of space, this article is abbreviated in THE JOURNAL by omission of protocols of animal experiments. The article appears in full in the Transactions of the section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

1. After the main question of the vulnerability of the marrow had been determined, the work was divided. Dr. Oliver continued his investigation on the histologic features of the tubercle.

guinea-pigs. The animals were killed at varying intervals after the operation.

Our intention was usually to inject into the metaphysis of one tibia and into the central canal of the other, but in point of fact the canal extends so high in the tibia that practically all injections were into it.

The specimens were hardened in 10 per cent. formaldehyd solution or in alcohol, dehydrated in alcohol, mounted in paraffin, and stained with hematoxylin and eosin, with the Van Gieson stain, and for tubercle bacilli with the Ziehl stain.

A complete description of the findings is appended. The results will be summed up here.

EXPERIMENTS ON RABBITS

Rabbit 41 0: Killed fifty-one days after injection. Right tibia, tuberculosis present macroscopically and microscopically. No tubercle bacilli found. Left tibia kept for gross demonstration. Tuberculosis demonstrated macroscopically in it.

Rabbit 42 0: Killed forty days after injection. Both right and left tibias showed tuberculosis and tubercle bacilli present.

Rabbit 43 0: Killed fifty-four days after injection; blocks lost.

Rabbit 44: Killed on day of operation. Right and left tibias showed neither tuberculosis nor tubercle bacilli.

Rabbit 45: Killed thirty-three days after operation. Both right and left tibias showed tuberculosis macroscopically and microscopically, but no tubercle bacilli in either.

Rabbit 46: Killed thirty-two days after operation. Both right and left tibias showed tuberculosis macroscopically and microscopically; tubercle bacilli in neither.

Rabbit 47: Killed thirty days after operation. Both right and left tibias showed tuberculosis macroscopically and microscopically; tubercle bacilli were found in the right, none in the left.

Rabbit 49: Killed one day after operation. Right and left tibias showed neither tuberculosis nor tubercle bacilli.

Rabbit 75: Killed two days after operation. Right and left tibias showed no sign of tuberculosis or tubercle bacilli.

Rabbit 76: Killed seven days after operation. Both tibias showed neither tuberculosis nor tubercle bacilli.

Rabbit 77: Died fifteen days after operation. Both tibias showed neither tuberculosis nor tubercle bacil[li]

Rabbit 78: Killed twelve days after [op]eration. Right tibia showed tuberculosis microscopically and a few tubercle bacilli.

Omitting Rabbit 43 0 whose marrow specimens were lost, we have here 11 rabbits. In 6 tuberculosis was demonstrated, in 5 it was not. The 5 in which it was absent were killed respectively the day of operation, and one, two, seven, and fifteen days after operation. All animals killed after a greater interval than fifteen days, and one after an interval of twelve days showed distinct marrow tuberculosis. In other words, in every animal allowed to live over one week, save one, tuberculosis was demonstrated.

Tubercle bacilli were recovered from both tibias of Rabbit 42 0 (forty days), from the right tibia of Rabbit 47 (thirty days), and from the only operated tibia in Rabbit 78 (twelve days).

Others have noted the difficulty of recovering bovine tubercle bacilli from the marrow. In two tibias of our series they could be found only by diligent search. Typical giant cells are rare. Friedrich[2] made this observation.

The "fibromyxomatous" marrow described by Fraser is a practically constant phenomenon in the neighborhood of the tuberculous marrow, but is not peculiar to tuberculosis. It is probably present in most slow marrow inflammations, and we regard it as Nature's protective reaction against the spread of infection, not as a mysterious change which the marrow undergoes before it can be invaded, and when tuberculosis is in the neighborhood.

Another very suggestive fact that we (Dr. Cowan and I) have observed in another series of experiments (not tuberculosis experiments) on rabbits' cartilages, is the presence of a thin strip of fatty marrow which frequently is present near the circumference of the end of the femur (that is, close to the attachment of the capsule). We believe this band of yellow marrow is responsible for Fraser's contention that the lymphoid marrow of the bone end must change to fatty marrow before it can be invaded by tuberculosis from the synovial membrane.

Conclusion: The lymphoid marrow of rabbits' bones is a good field for the growth of bovine tubercle bacilli.

EXPERIMENTS ON GUINEA-PIGS

Six guinea-pigs were employed, and were killed or died respectively, four, six, six, nine, ten and fifteen days after operation. All showed tuberculosis of the marrow, and in all tubercle bacilli were demonstrated.

Conclusion: The lymphoid marrow of guinea-pigs' bones is a good field for the growth of human tubercle bacilli.

It is now five years since the theory was first published that the location of tuberculosis in bone was determined by the presence of red or lymphoid marrow. I should like at this time to sum up the evidence to date:

1. Tuberculosis is found only in those bones or regions of bone where lymphoid marrow is present.

2. Marrow tuberculosis is more common in children, whose bones contain more red marrow. As age advances, marrow tuberculosis becomes rarer and less destructive.

3. After resections in adults, if secondary infection be avoided, the disease disappears. The best authority available says that after resections the lymphoid marrow disappears.

4. Experiments show that lymphoid marrow is an excellent field for the growth of tuberculosis.

Two links are missing in the chain of evidence; that is, the demonstration of the particular cells in the lymphoid marrow which are responsible for the disease there, and the proof that tubercle bacilli will not grow in yellow or fatty marrow. It will be instructive also to learn the exact morphologic changes which take place in the marrow after a resection.

Lane Hospital.

2. Friedrich: Deutsch. Ztschr. f. Chir., 1899, liii, 532.

ABSTRACT OF DISCUSSION

DR. JOHN F. COWAN, San Francisco: What Dr. Ely has said on the question of marrow tuberculosis is exceedingly interesting, in view of the paper which was presented to this section at its meeting in Atlantic City last year by Mr. John Fraser of Edinburgh. It is said that it is very difficult, and in many cases, impossible to infect healthy marrow with tubercle bacilli; that in order for the marrow to become a fertile field for the growth and development of tubercle bacilli, it is necessary for it to undergo certain changes, which he describes as a colloid degeneration, or a fibromyxomatous change; that these changes in the marrow are due to an obliterating endarteritis, resulting from a tuberculous toxemia arising from a tuberculous process in some other portion of the body. Now we do not find

in uncomplicated cases of tuberculosis much toxemia. Tuberculous toxins cause lesions locally; that is, in their immediate presence; not at a distance by diffusion of the toxins. At least, the kidneys never show any effect which could be ascribed to the elimination of a tuberculous toxin through them. In these experimental animals we do not find evidence of tuberculosis in other parts of the body. Postmortem examination shows tuberculosis of the marrow, but no tuberculous lesions in the lungs, lymph nodes, etc., so that it is difficult to ascribe the local vascular changes to a general toxemia. Arterial degeneration is not found as a frequent condition in tuberculosis. In fact, in advanced cases of tuberculosis, instead of finding arteriosclerosis, there is an atrophy of the vessels, as there is an atrophy of the other tissues of the body. However, there are changes in the vessels in the immediate vicinity of the tuberculous process, but these are not due to a general toxemia, but rather to the local chronic inflammation. In tuberculosis we do not find necrosis as an early factor. One may see endothelial leukocytes filled with tubercle bacilli and yet one may not find any degenerative changes in these cells. I have had the privilege of examining Dr. Ely's specimens. In some of them characteristic tubercles are seen, but with slight or no evidence of changes in the blood vessels; and this absence of an obliterating endarteritis is probably due to the fact that these animals were killed at short periods after inoculation. It seems highly probable that the bone marrow of the experimental animals may be primarily infected by tubercle bacilli.

REVIEW OF RECENT STUDIES IN TRICHINIASIS

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NEW YORK

Trichiniasis is not a mere medical curiosity; it is a common and important disease and one all too seldom recognized. A disease having an average mortality about half that of typhoid fever, and in some epidemics a mortality rising to 16 or even 30 per cent., as in the Hedersleben epidemic[1] in 1865, is serious. Proof that it is a common disease may be had from studies such as that of Williams,[2] who in 105 unselected necropsies in the state of New York found trichinella embryos in 5.4 per cent. In other civilized communities, this parasite is found in from 0.5 to 2 per cent. of necropsy subjects. About 6 per cent. of American swine, and a larger percentage of American rats are infected.

Recent years have added much to our knowledge of trichiniasis. The life history of the parasite and its methods of migration and distribution in the body of its host have been quite conclusively worked out. The symptoms have been adequately described and new methods of diagnosis brought into use. It remains to study more extensively certain symptoms of the disease, with a view to a more complete understanding of some as yet unsolved problems.

One of these symptoms is fever. It is interesting that the *Trichinella spiralis* is the only metazoic parasite that, infesting man, causes fever with constancy. Filariasis, hydatid disease, bilharziasis may give rise to fever, but exceptionally. In trichiniasis alone, of the parasitic disease of this class, is fever almost always present. Such fever may be due to secondary bacterial infection, to the toxic products elaborated by the trichinella, or may be a true protein fever from the parenteral introduction of alien material, either in the form of the embryo of the trichinella itself, or a devitalized body protein formed as a result of the activities of the parasite.

Evidence in favor of the first hypothesis is contradictory. The female trichinella within a week of infection burrows beneath the submucosa of the duodenum, often destroying two or three villi, and deposits embryos in the lymph spaces of the submucosa, thus giving opportunity for micro-organisms to gain entrance to the lymph channels and blood stream (Frothingham[3]). In this way a bacteremia may arise. Bacteremia in trichiniasis in man is rare. Staübli[4] mentions a severe case in which there was very high fever, and in which streptococci in pure culture were found in the blood and urine. In the second case, deep intramuscular abscesses containing numberless staphylococci were found. Friedreich[5] mentions the frequency of furunculosis as a complication of trichiniasis. In one of his cases the embryo was found in the midst of one of the furuncles along with staphylococci.

That meat containing bacteria and trichinella can give rise to a double infection seems fairly well established by a report of Chiari and Zorkendorfer[6] of an epidemic in which sixty-eight persons were made ill by eating sausage. Twenty-one of these patients showed severe symptoms with notable enlargement of the spleen. Four of the patients died and came to necropsy. The muscles of all these showed trichinella embryos, and the spleen and blood, anthrax bacilli. The *mettwurst* causing this epidemic was made from pork and a variety of other meat some of which was, in this instance, thought to be from an animal infected with anthrax. Staübli[4] examined the peritoneal exudate and blood from the hearts of two guinea-pigs dying from trichiniasis, and in one found a diplococcus, in the second, streptococcus in both regions. Romanovitch[7] could find no bacteria in infected tissue on section. However, on examination of the blood of thirty-six trichinous rats, twenty-six showed bacteremia. Of fourteen such guinea-pigs eleven showed bacteremia. The bacteria were of various kinds, streptococci, staphylococci, etc. Gruber[8] made cultures from the heart blood of fifteen guinea-pigs infected with the trichinella; only three were positive. These were in such small numbers that Gruber thought them probably contamination.

In the search for clinical data on the question of bacteremia in trichiniasis I have reviewed the cases in the Roosevelt and St. Luke's Hospitals of New York observed during the past five years, and have found that of ten cases with blood culture in none were bacteria demonstrated.

The weight of evidence is against the bacterial origin of the fever of trichiniasis. Additional argument is the conclusion of McNeal and Chace,[9] who found that in the normal duodenum bacteria are few.

1. Cited by Staübli: Trichinosis, Wiesbaden, 1909, p. 16.
2. Williams: The Frequency of Trichiniasis in the United States, Jour. Med. Research, 1901, vi, 64.
3. Frothingham, C. Jr.: A Contribution to the Knowledge of the Lesions Caused by Trichinella Spiralis in Man, Jour. Med. Research, 1906, x, 483; The Intestinal Lesions Caused by Trichinella Spiralis in Rats, Arch. Int. Med., January, 1909, p. 505.
4. Staübli: Trichinosis, Wiesbaden, 1909, p. 141.
5. Freidreich: Beobachtungen über Trichinosis, Deutsch. Arch. f. klin. Med., ix, 459.
6. Chiari and Zorkendorfer: Ueber die Aetiologie einer Massenerkrankung in Teplitz Schönau nach dem Genusses von Fleisch und Wurstwaren (Trichinose und Milzbrand), Ztschr. f. Heilk., 1894, xv, 435.
7. Romanovitch: Recherches sur la trichinose, Ann. de l'Inst. Pasteur, 1912, xxvi, 351.
8. Gruber: Neue Studien über die Pathologie der Trichinose, München. med. Wchnschr., 1914, lxi, 645.
9. McNeal, Ward J., and Chace, Arthur F.: A Contribution to the Bacteriology of the Duodenum, Arch. Int. Med., August, 1913, p. 178.

It seems more probable that the fever of trichiniasis is a true protein fever in the sense of Vaughn;[10] that it is due to the parenteral introduction of alien protein material. It has been estimated[11] that in a severe case of trichiniasis as many as 50,000,000 embryos escape into the circulation during the acute stages of the disease. Virchow[12] and later, Leuckart,[13] found numbers of embryos in the serous cavities. It is believed many perish here and doubtless in other tissue spaces. This process insures the absorption of no small amount of foreign protein. The matter, however, does not rest here. The question is carried much further by the work of Flury,[14] and of Flury and Groll.[15]

These observers, in a study of the chemistry and toxicology of the disease, brought out several important points. They found trichiniasis in animals accompanied by definite changes in muscle metabolism. While the embryos became rich in glycogen during their intramuscular development, the invaded muscles became relatively or absolutely glycogen-free. Liver glycogen was also reduced. The muscles contained increased amounts of water, also of creatin and purins in general, ammonia, lactic acid and volatile acids, while the total acidity was heightened. Corresponding with these alterations in the chemistry of muscle tissue the urine during the first five to seven days of the infection gave indication of a retention of the nitrogenous products of muscle catabolism which was followed after five or seven days by an abnormally high excretion of creatin, purin bases, lactic acid, ammonia, indican, and fatty acids. The strongly positive diazo reaction is doubtless related to this factor. Flury found also a poison in the invaded muscle resembling curare in its effect on the neuromuscular mechanism of the frog, an observation of clinical interest as partly explaining the extreme muscular weakness of the disease. This poison belongs to the caffein group of purin bases, and bodies of allied chemical and pharmocologic properties. The blood showed hydremia, a lower specific gravity of the serum, increased fragility of the erythrocytes, high content of nucleoprotein and strong albumose reaction.

Flury and Groll attribute the symptoms of the disease to poisons that are both exogenous—developed from the trichinellae themselves, and endogenous—formed by the destruction of muscle tissue. These consist chiefly of purin bases, adenin, guanin, hypoxanthin, xanthin, and other split products of muscle protein which act on the muscles themselves, on the nervous system and the blood vessels. The extravasations of blood in the lungs, connective tissue, meninges and other tissues are, in Flury's opinion, brought about by capillary poisons elaborated in the trichinous muscle probably by the trichinellae themselves. There is, therefore, both a quantitative and qualitative alteration in muscle catabolism with production of protein split products apparently peculiarly toxic.

Devitalization of such large amounts of muscle tissue by the activity of the trichinella gives rise to proteins which have an action similar to alien proteins, since *körpereigend* protein devitalized becomes physiologically *körperfremd*.

It seems quite clear that with the invasion of the blood stream and tissue spaces by millions of embryos and with the breaking down of large amounts of muscle tissue we have in effect, the constant inoculation of the patient with alien protein material, a condition which, as is well known, gives rise to fever.

The most striking and constant symptom of trichiniasis is the increase in eosinophils in the blood. This is not a relative increase alone; it is also absolute. A high total leukocyte count is quite as constant as the high eosinophil percentage. This eosinophilia arises during the migration of the embryos, from five to seven days after infection, and may persist years after the symptoms have subsided, or may disappear within a few weeks. As an instance of the persistence of this feature, I mention a case under my own observation. The patient, a woman of 24, ate *lachschinken*, Christmas day, 1911. She became ill Jan. 1, 1912, and was confined in bed for seven weeks with very severe trichiniasis, complicated by femoral phlebitis. In December, 1914, almost three years after the onset of the illness, the leukocytes were 9,000, the eosinophils 9 per cent.

From complete obscurity the question of the cause of this cellular reaction has become at least partially clear. That the eosinophilia of the helminthides is a reaction to the invasion of the body by alien protein is a fact apparently well established by the work of a number of observers. Ahl and Schittenhelm,[16] Schittenhelm, Weichardt and Grisshammer,[17] Schlecht,[18] Schlecht and Schwenker[19] have by a variety of experiments shown conclusively that the parenteral introduction of alien protein and of many of its split products into guinea-pigs, dogs and rabbits is followed by notable eosinophilia. Herrick,[20] working with an extract of the *Ascaris lumbricoides*, found a similar increase of cells resulted from injection of such extract at intervals of five days or more, but that repeated injections at shorter intervals did not bring about such a result. It was found, further, that the substance in the extract of the ascaris giving rise to the cellular reaction was a protein. By this observation the eosinophilia of ascaris infestation and therefore presumably of other helminthides may be linked with the work of the German observers cited above. The mechanism of this reaction is obscure. The interpretation most in accord with experimental and clinical facts seems to be that proteins of *körperfremd* nature or their split products bring about the formation of protcolytic enzymes which have a chemotactic influence on the eosinophils as shown by local or general eosinophilia. This theory has been expressed by a number of workers—most recently by Schwartz[21] whose monograph with its 2,758 references is a remarkably complete catalogue of facts about the eosinophils.

10. Vaughn: Protein Split Products, Philadelphia, Lea and Febiger, 1913, p. 373.
11. Heubner: Beobachtungen über Trichinosis, Jahrb., Jena, 1911, xxv, 569.
12. Virchow: Ueber Trichina spiralis, Virchows Arch. f. path. Anat., 1860, xviii, 535.
13. Leuckart: Die menschlichen Parasiten, Leipzig, 1876.
14. Flury: Trichinosis, Deutsch. med. Wchnschr., 1913, xxxix, 1388. Beiträge zur Chemie und Toxikologie der Trichinen, Arch. f. exper. Path. u. Pharmakol., 1913, lxxiii, 164.
15. Flury and Groll: Stoffwechseluntersuchungen an trichinosen Tieren, Arch. f. exper. Path. u. Pharmakol., 1913, lxxxiii, 214.
16. Ahl and Schittenhelm: Ueber experimentelle Eosinophilie nach parenteraler Zufuhr verschiedener Eiweisstoffe, Ztschr. f. d. ges. exper. Med., 1913, i, 3.
17. Schittenhelm, Weichardt and Grisshammer: Eiweissumsatz und Ueberempfindlichkeit, Ztschr. f. exper. Path. u. Therap., 1912, x, 412.
18. Schlecht: Ueber experimentelle Eosinophilie nach parenteraler Zufuhr artfremden Eiweisses und über Beziehungen der Eosinophilie zur Anaphylaxie, Arch. f. exp. Path., 1912, lxvii, 137.
19. Schlecht and Schwenker: Ueber die Beziehungen der Eosinophilie zur Anaphylaxie, Deutsch. Arch. f. klin. Med., 1912, cviii, 405.
20. Herrick, W. W.: Experimental Eosinophilia with an Extract of an Animal Parasite, Arch. Int. Med., February, 1913, p. 165.
21. Schwartz: Die Lehre von der allgemeinen und artlichen Eosinophile, Ergebn. d. allgemein. Path., 1914, xvii, 136.

A further point of interest in the development of knowledge of this disease is the observation of Van Cott and Lintz,[22] who for the first time described the finding of trichinella embryos in the spinal fluid. The embryos, obtained by ordinary lumbar puncture, were present in large numbers, and retained motility after five days in the ice chest. Thus far this finding has not been confirmed by further similar reports. In performing such puncture the greatest caution should be taken against introduction of trichinella embryos into the needle from tissue surrounding the spinal canal, or from punctured blood vessels. If the embryo can penetrate the sarcolemma of the primitive muscle fiber, it is not at all improbable that it can traverse the two layers of endothelium separating the blood stream of the choroid plexus from the cerebrospinal spaces.

For the future study of trichiniasis the points of greatest interest beyond the seemingly hopeless problem of therapy are the relation of bacteremia and the question of the presence of embryos in the spinal fluid. Blood cultures and lumbar puncture with examination for embryos are suggested as routine procedures in the clinical study of this disease.

49 East Fifty-Third Street.

REPORT OF CASES POINTING TO PURULENT INFECTION AS A CAUSATIVE FACTOR IN MUCOUS COLITIS

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In view of the multiplicity of causes to which mucous colitis is ascribed, and the lack of proof adduced in substantiating any of them, it may be questioned whether the chaotic mass of literature should be added to. Since, however, it is a condition so intimately associated with the abnormal functioning of the autonomic nervous system, of which so little is known, and which from its very nature must be investigated largely from a clinical standpoint, I have thought it worth while to report the following cases, which seem to have a direct bearing:

REPORT OF CASES

Case 1.—Mrs. A. S. C., aged 50, came under observation complaining of general debility, tenderness over the abdomen, bloating, palpitation, persistent constipation, with the passage of scybala and characteristic mucus, all together presenting a definite picture of mucous colitis. In addition she suffered from a pain of a neuralgic character through the distribution of the cervical nerves, and in the left frontal region. Her history was unimportant, except a nervous breakdown at the age of 30, and severe neuralgic pains of the face and neck four years prior to being seen, which subsided until November, 1914, when they recurred, together with the foregoing symptoms, and had continued in varying degrees since. Nothing could be elicited pointing to inflammation of any of the sinuses other than the pain complained of, she having no recollection of any discharge of pus or blood from the nose. Having in mind a paper by Dr. Starr,[1] in which he details his observations to the effect that many cases of neuralgia, neurasthenia and allied nervous diseases are due to the absorption of poisons from the intestinal tract, the head pains were at first supposed to result from this source, and she was temporarily put on a treatment of laxatives and intestinal antiseptics, with no beneficial results. In a search for a more direct cause of the neuritis, following the negative report of a competent dentist as to the source of infection existing among her teeth, she was referred to an oculist, who reported the occlusion of the left frontal sinus, as shown by transillumination. He removed the left middle turbinate and released a quantity of foul-smelling pus, which not only resulted in the almost immediate improvement of the neuritis, which would of course have been expected, but also of the abdominal symptoms, as evidenced not only by the prompt diminution of the palpitation, bloating and mucus, but also the constipation. She reported six weeks later that while there was still some discharge from the head, the bowel symptoms were practically cured, there was no mucus, and what was more surprising, that she had not found it necessary to take medicines for constipation for the past month.

Case 2.—J. L. B., aged 40, foreman in a bridge works, requested treatment in April, 1915, on account of digestive disturbances and headaches. He stated that two years previously, he had nasal polypi removed, and his health had since been good until October, 1914, when he first noticed mucus in his bowel movements, and about the same time began to suffer from bloating of the abdomen, and headaches. These symptoms gradually grew worse; he became constipated, and unless he took laxatives regularly, his feces, which had previously been normal, were dry and lumpy, and always contained mucus. His appetite was poor, and his food disagreed; he became nervous and irritable, and was unable to take an interest in his work. He developed soreness and pain over his abdomen, and on account of bloating was compelled, much of the time, to wear his clothes unfastened. These symptoms continued in varying degrees over a period of about three months, when the severe headaches, together with the findings as previously detailed, focused attention on his sinuses, and on referring him to a nose and throat man, it was found that there was a necrotic condition at the point from which the polypi had been removed, and further search disclosed inflammation of the ethmoid. This was drained, and while the operation was complicated by a severe secondary hemorrhage, and healing was slow, without further medication all of the symptoms have gradually cleared up. His digestive and nervous symptoms have disappeared, and he has not for some time required medicine for the relief of constipation. He again takes a lively interest in his work and plans.

Case 3.—A. C. T., aged 33, traveling salesman, was first seen Jan. 13, 1914. He gave a history of fair general health, previous to four months before, when he began to suffer with vague pains throughout the abdomen, sleeplessness, a tendency to looseness of the bowels, alternating with constipation, and the passing of tenacious mucus, which was worse on dieting, soreness in the right iliac region, and over the splenic and hepatic flexures of the colon. He had drifted from one physician to another, and a difference of opinion had existed among those consulted as to the advisability of an operation for appendicitis. No organic disease could be made out, but it was noted that his teeth had been badly neglected, and that some of them showed abscesses. As there was but little benefit from a month's treatment of the colitis, he was prevailed on to have the offending teeth extracted, which he had done in March. He reported at the end of the second month that all of his symptoms were markedly improved, in spite of the fact that he had for a time experienced difficulty in masticating his food on account of soreness of the gums. Later inquiry elicited the fact that his bowel movements were regular, without medicine, no bloating, discomfort, or mucus, his sleep good, and his general health normal.

Craig[2] reports a case of arrhythmia associated with angina, cured by draining abscesses of the teeth, and also in the same article one of dizziness, cardiac symp-

22. Van Cott, J. M., and Lintz, William: Trichinosis, The Journal A. M. A., Feb. 28, 1914, p. 680.

1. Starr: The Toxic Origin of Neurasthenia and Melancholia, Med. Rec., New York, May 11, 1910.

2. Craig, C. Burns: Peridental Infection as a Causative Factor in Nervous Diseases, The Journal A. M. A., Dec. 5, 1914, p. 2027.

toms, mental depression, and incidentally "slight evidence of catarrhal colitis," all of which cleared up promptly on the removal of a bridge and drainage of abscesses.

Since the causative relation of an infection to the syndrome of mucous colitis has suggested itself to me, I have been interested in reviewing my notes of cases treated previously to find that among them were two of fistula in ano, one of a purulent infection of the fallopian tubes, and one of a severe pyorrhea. Surgical and dental treatment was suggested in each of these, but not insisted on, as would have been done had it then occurred to me that the foci might be of etiologic importance. Each passed from observation but slightly improved. These cases, of course, prove nothing, but I believe are worthy of mention.

Rather than speculate as to what products may be absorbed from a purulent focus, or how they may throw the autonomic nervous system out of balance, one may with propriety call attention to some similar well-known, but little understood, conditions, notably the urticaria, with its complex of symptoms, observed in susceptible individuals on eating shellfish; the symptoms of anaphylaxis resulting in others from the ingestion of the albumin of an egg; the systemic effect of the presence of certain pollens in the hay-fever subject, and finally the effect of the subcutaneous introduction of even a minute quantity of a protein into the circulation.

Bearing in mind the intimate relation and influence of the secretions of the adrenal, thyroid, and pituitary glands on the functioning of the system under consideration, the findings of Rosenow[3] tending to show that goiter, particularly exophthalmic, with its kindred symptoms, is due to a direct infection, are worthy of note in this connection; but after all a sensitization resulting from the more or less constant absorption of toxins or other products would seem more probable.

215 South Jefferson Street.

THE EFFECT OF TYPHOID VACCINATION ON THE WIDAL REACTION

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In 1896 Widal and Grünbaum, each working independently of the other, applied the principle of agglutination, as previously recognized by Gruber and Berdet, to the diagnosis of typhoid fever. Since then the Widal reaction, when present, has been considered by most clinicians as the last word in the diagnosis of this disease.

In 1908, however, when Major Frederick F. Russell first began using antityphoid vaccine in the United States Army, and the practitioners over this country gradually followed his lead, a new phase in the diagnosis of typhoid occurred. It was soon recognized by observers that a positive Widal reaction always followed a prophylactic dose of typhoid vaccine. The vaccine, however, had not been in use a sufficient time to ascertain the length of time this reaction persisted. While we now believe the presence of a positive Widal reaction is not necessary for immunity, but that the patient may still be immune after the reaction has ceased to exist, it is not our purpose to discuss this phase of the question here. However, the presence of the reaction is of the greatest importance if typhoid fever is suspected.

Since 1910, at the Springfield State Hospital, there have been 2,766 prophylactic doses of typhoid vaccine given and at intervals specimens of blood have been taken to ascertain the presence or absence of the Widal reaction. During the first eighteen months after the typhoid vaccination was adopted at this hospital each patient received three doses of the vaccine at intervals of one week. The first dose consisted of 125 million killed bacteria, in salt solution. The second dose consisted of 250 million and the third dose consisted of 500 million killed bacteria. At the end of eighteen months we adopted the dosage which we now use; namely, 250 million, 500 million and one billion killed bacteria, given at intervals of one week. The patients, however, who received the original smaller doses were not reinoculated, but their blood was examined with the rest. All of the specimens of forty-eight and fifty months belong to patients who received this smaller dose of the vaccine.

In making the Widal test we use an old strain of bacteria which are known to be easily agglutinable. These are transferred from the agar slants to bouillon and are used when from eighteen to twenty-four hours old. The blood of the patient is collected in capillary beads, allowed to stand for a few hours until the serum separates. This serum is then diluted 1:25 and an equal portion of it and the bouillon culture are mixed, thus making a dilution of 1:50. A hanging drop is then made in the usual manner and allowed to stand one hour, when it is examined and the result read. A control in which salt solution instead of serum is used is similarly prepared to guard against artificial clumping. Only the blood of patients who could give a clear history of never having had typhoid fever was examined. Blood was taken from patients at the end of one month, six months, twelve months, twenty-four months, thirty-six months and forty-eight months, respectively, with the following results:

One month: Ten specimens of blood all gave positive Widal reactions.

Six months: Ten specimens of blood all gave positive Widal reactions.

Twelve months: Ten specimens of blood all gave positive Widal reactions.

Twenty-four months: Ten specimens of blood gave seven positive and three negative Widal reactions.

Thirty-six months: Ten specimens of blood gave six positive and four negative Widal reactions.

Forty-eight months: Ten specimens of blood gave three positive and seven negative Widal reactions.

One patient inoculated fifty months ago still had a positive Widal reaction.

From the foregoing we would emphasize the fact, as already stated by Hirschbruch,[1] that a positive Widal reaction in any person who has ever been inoculated with the antityphoid vaccine is of no value in diagnosing typhoid fever. The only reliable way of ascertaining the cause of continued fever when typhoid is suspected is by the blood culture and a total and differential leukocyte count.

Springfield State Hospital.

3. Rosenow, E. C.: The Newer Bacteriology of Various Infections as Determined by Special Methods, THE JOURNAL A. M. A., Sept. 12, 1914, p. 906.

1. Hirschbruch, A.: Agglutination After Vaccination Against Typhoid, Deutsch. med. Wchnschr., April 29, 1915.

RADIUM IN THE TREATMENT OF CARCINOMAS OF THE CERVIX UTERI AND VAGINA*

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The scope of this paper has been intentionally limited to a consideration of the value of radium in treating the malignant epithelial new growths of the vagina and cervix uteri. Equally interesting technical problems and clinical phenomena are met when radium is used in treating other kinds of malignant tumors, for example, the sarcomas and carcinomas, and tumors in other organs, as the bladder, breast, tongue, etc. The technic, the indications for treatment and results obtained vary with the type of tumor and its location so greatly that each demands separate consideration. It is especially difficult to have to exclude the adenocarcinoma of the fundus uteri, as it is quite radiosensitive and as we have of it the most excellent material, both clinical and anatomic. The problems connected with its surgical as well as radium treatment, however, differ widely from those of the cervical—uterine and vaginal — cancers.

Absolute valuation of a therapeutic agent is obtainable only after all methods of using it have been tried out on carefully selected and classified cases over a period of years. Our knowledge of the curative action of radium on cancers of the uterine cervix and vagina is as yet in its infancy; nevertheless, its ultimate possibilities, viewed in the light of present experience, seem very great. That it does greatly increase the percentage of the curable cases of these cancers and correspondingly diminishes the percentage of the incurable is already evident and demonstrable.

So far as is known, untreated cancers of the cervix uteri and vagina do not heal spontaneously and do inevitably lead to painful death after a period of suffering varying from a few months to several years.

The continuous and painstaking work and investigations of many surgeons and pathologists through a period of more than two decades have firmly established the accepted surgical technics with their proved five year cures. During this time there has been accumulated an immense store of information regarding the occurrence, the etiologic importance of trauma, the histopathology, the avenues of extension, the rate of growth and the complications of these malignant, epithelial new growths.

The Wertheim radical hysterectomy, in our opinion, yields a higher percentage of permanent cure in cancer of the uterine cervix than does any other operative procedure. It affords, however, much less help in the treatment of primary cancer of the vagina.

Nothing is more misleading than a gross statistical statement of so many patients operated on, such a primary mortality and so many permanent cures. The operator who takes only the early and moderately advanced cases has a lower primary mortality and a higher permanent cure rate than does the one who treats many of the border-line operable type. Where a professional and public educational campaign against the disease has been carried out, as in Vienna, the proportion of easily operable cases is much larger than where such advanced methods have not been followed. Great need exists for reports on carefully classified groups of cases, and not only the extent of the growth but also its histologic type should be taken into account in the group separations.

A statistical report by Howard A. Kelly and J. Craig Neel of the cases of uterine cervix cancer seen at the Johns Hopkins Hospital up to August, 1913, shows 57 per cent. operable, 11 per cent. primary mortality and 25 per cent. permanent cure. It is of interest that only one case of adenocarcinoma remained free from recurrence for two years after the operation. Wertheim[1] states that 50 per cent. of his cases are operable, and that 50 per cent. of those patients operated on remain well. Krönig[2] states that not more than 20 per cent. of the cervix cancers are permanently cured by operation and less than 5 per cent. of the primary vaginal cancers.

The present report is based on a series of 213 cases of cancer of the uterine cervix and vagina treated with radium at the Howard A. Kelly Hospital, between Jan. 1, 1909, and Jan. 1, 1915. Although one of the cures dates from 1909, it was not until December, 1912, that we secured sufficient radium and developed sufficient enthusiasm to employ it systematically, and indeed only in the last eighteen months have the patients in the operable class been invariably radiated as well as operated on. Of the 213 cases, fourteen were operable and 199 inoperable or inoperable recurrent cancers. We have refused treatment to no inoperable case that has come to the hospital, although we have discouraged the coming of patients with evident general carcinomatosis. Before passing to a detailed analysis of these cases and the results obtained by treatment, it seems necessary to discuss very briefly some questions of technic, of histologic change (in radiated tissue) and of theory as to the mechanism of the action of the rays on tissues both normal and pathologic.

It would be most profitable here to digress into a most fascinating field of human knowledge, but time does not permit even a bare outlining of the physical properties of radium. Suffice it to say that radium is obtainable in stable form as a bromid, chlorid or sulphate, and that by appropriate means radium emanation, a gas, can be separated from the radium salts.

In order to carry out such a radium radiation, as the cases under consideration require, it is necessary to have applicators which hold either dry radium salts or the emanation of radium. The emanation has a great advantage in that it is possible to vary the size, shape and strength of the applicator at will and for each case; it requires, however, considerable skill in glass blowing and in mercury vacuum-pump manipulation.

Figure 1 shows a few applicators; the millimeter rule permits an easy estimation of size. The small tube between the needles is a glass capillary in which any amount of emanation between a fraction of a millicurie and a curie (equal to a gram of radium) can be placed. This can be inclosed in a metal container of its own shape and length, or it may be placed in the outer end of one of the record syringe hypodermic needles, shown on either side of it. Immediately to the right of the needle is an applicator containing 100 mg. of pure radium chlorid in a glass tube encased

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1. Wertheim: Strahlentherap., iii, 537.
2. Krönig: Strahlentherap., iii, 28.

in a thin platinum envelope 0.4 mm. thick, and all covered by a small rubber cot about 3 mm. thick. Still further to the right is shown the platinum envelope necessary to hold 100 mg. of pure radium chlorid. The last figure to the right shows a small flat applicator. These can readily be made an inch or two in diameter, and will hold immense or small amounts of emanation as desired. Through the glass container are emitted from the radium two kinds of rays: the beta and the gamma.

The beta ray is particulate matter, a negatively charged ion, deflectable by an electromagnet, entirely absorbed by 3 mm. of lead, or 2 cm. of tissue. Occurring in ten times the quantity of the gamma rays, it produces much more marked destructive biologic effects.

The gamma ray is a vibration of ether of extremely short wave length. It is comparable to ordinary light and the Roentgen ray. It is extremely penetrating, passing through inches of lead or feet of tissue.

When tested by the heavy metals, such as lead, platinum, etc., both the beta and the gamma rays vary as to penetration. There are soft, medium and hard rays of each class; however, according to Keetman and Mayer, the absorption of these rays in tissue is as if they were uniform, that is, for a given thickness of tissue there is an equal percentage of absorption of the rays going through it. The work of Keetman and Mayer carried out with mesothorium is being repeated with radium in our physical laboratory, but is not yet finished. According to them, 8 per cent. of the beta rays are absorbed by each one-tenth millimeter of tissue and 5 per cent. of the gamma rays by each centimeter of tissue. Beta and gamma rays can be used together or the gamma ray can be used alone by placing a 2 cm. lead screen or a 1 mm. platinum screen between the radium and the part treated.

Thickness of Tissue Traversed, cm.	Absorption of Tissue, per Cent.	Radiation Transmitted, per Cent.	Dispersion Correction	Intensity of Radiation per sq. mm.	Amount of Radium Unit to Give One mg.
0	0	100	0	1	2.500
1	5	95	0.495	0.66	3.788
2	9.75	90.25	0.51	0.464	5.410
3	14.3	85.7	0.39	0.335	7.463
4	18.6	81.4	0.31	0.251	9.950
5	22.17	77.83	0.25	0.194	12.880
6	26.08	73.94	0.207	0.153	16.330
7	29.76	70.24	0.174	0.122	20.480
8	33.3	66.7	0.147	0.098	25.500
9	36.7	63.3	0.128	0.081	30.870
10	40	60	0.11	0.066	37.500

In addition to absorption in tissue, another most important factor in determining the intensity of radiation, on any surface, from a uniform source, is the distance from the source; for the intensity as in all spherical dispersion varies inversely with the square of the distance. If, for example, we place 1 mg. of radium 1 mm. distant from a 1 mm. square surface and then extend the distance to an inch or 25 mm., the intensity at 1 mm. distance is 625 times that at the distance of 1 inch, as can be readily calculated.

Taking the 1 mg. at 1 mm. in one second on 1 square mm. of surface, as the unit of dosage, and taking in the factors of spherical dispersion and tissue absorption, the table inserted above shows the effects at various depths and the quantity of radium which is necessary to produce a unit dose in one second when the applicator is placed 5 cm. away from the surface.

A factor not considered in the table but of the highest importance, is that, within certain limits, increasing the duration of the application correspondingly diminishes the amount of radium required to produce the unit energy: for example, a unit dose at a depth of 5 cm. can be secured with 1 gm. radium in 12.88 seconds, or with 200 mg. of radium in a little more than a minute.

Figure 2 shows graphically the changes in intensity of gamma radiation at different depths in the tissue.

It is evident that when beta radiation is needed in the depths, it can be secured by placing the emanation-containing needles at equal distances, never greater than 1 cm. from each other, throughout the entire area to be radiated. When gamma radiation alone is used, it should be borne in mind that the greater the distance the radium is placed from the surface, the greater the relative penetration secured in the depths. The ideal radiation is a homogeneous and equal one throughout the entire affected volume.

Consideration of the above facts makes it clear why to do extensive work adequate amounts of radium are necessary, and why the statements of so many milligram hours with such and such filters mean little or nothing unless the distance worked at is clearly stated. It is also, we think, evident that each case must be individualized and appropriate radiation given. In cancers along the vaginal wall, especially on the rectal side, it is of advantage to have flat applicators and to get within a few millimeters of the vaginal surface, as in this way the infected vagina gets a maximum and the rectum a minimum radiation. In radiating the regional lymphatic glands or upper parametrium, a number of portals should be used from the abdomen, back, vagina and perineum, at distances varying from 2 to 5 inches from the surface. Figures 3 and 4 show schematically the common locations and distances of the cervical and vaginal cancers from the body surface. We propose in a separate communication to deal exhaustively with the technic of radiation and will not go into further detail here.

Excellent descriptions of the histopathologic changes found in the cancerous uterine cervix after intense radium radiation can be found in the reports of Hansemann[3] and Haendly.[4]

Beginning a week after radiation there is swelling of the cell protoplasm, hyperchromatosis and pyknosis of the nuclei. After five or six weeks, the cancer cells are entirely gone, the connective tissue and blood vessels show hyaline changes. There may be a marked infiltration with polymorphonuclear leukocytes, and often giant cells are present. At a later stage this necrotic and inflammatory tissue is replaced by ordinary connective tissue. When radium is placed directly within the cervix and left sufficiently long, changes of this type invariably occur.

We have eight uteri removed a sufficient time after radiation to study the changes in the tissues. Vestiges of cancer have been demonstrated in only three of these. All will be serially sectioned and reported on in detail in a later communication. All were from patients with cancers originally inoperable.

It should be borne in mind that the intense inflammatory changes described above follow overradiation and are due to imperfect technic. The action of the rays is not in a true sense specific; normal tissues as

3. Hansemann: Berl. klin. Wchnschr., 1914, No. 23, p. 1064.
4. Haendly: Berl. klin. Wchnschr., 1914, No. 2, p. 86.

well as pathologic are injured and can be easily destroyed. There are wide variations in the resistance to radiation in different normal tissues. The vaginal wall and cervix are very resistant, enormously more so than skin. Bumm of Berlin gave currency to a widely accepted dictum that the limit of the gamma-ray efficiency (in tissue) was 4 cm. It is probably true that it is not possible to place radium directly in the cervix and radiate sufficiently to destroy the cancer cells beyond 4 cm. without causing severe local destruction of normal tissues; but it is possible to radiate from almost any distance by proper disposal of the applicators. In one case we cleared up an extensive vaginal cancer by radiation through the vulva, the radium being placed 10 cm. from the surface of the vulva. In another patient who did not recover, but died of general cancer, we saw large metastatic deposits disappear from the iliac lymphatic glands—the patient was thin and the masses easily outlined.

Our view of the action of radium is that, to markedly varying degrees, it injures all tissues, and that the injury is some kind of intracellular chemical change. It seems to us improbable, however, that the disappearance of cancer cells without any demonstrable effect on normal cells can be due solely to a difference in resistance of the cells to radiation. The common observation that in two cases with the same type of growth, subjected to the same radiation, different results are obtained; that in one the cancer disappears promptly and in the other is not affected at all, suggests the importance of resistance in the patient. It also opens up a wide field for speculation and experimental investigation as to what this resistance may be, where it is located, how it may be artificially produced, etc.

Radiation carried to the extent of severe injury of normal tissue may defeat its own ends. We have observed in one specimen of uterine cancer and several specimens from other parts of the body a condition which needs interpretation. In the cervix cancer the facts are as follows: The patient came in with solidly fixed parametria; intense intracervical radiation was given with the result that the uterus became freely movable; after six weeks hysterectomy was performed. Microscopic study showed from within outward, (1) a zone of necrosis; (2) a zone of greatly modified connective tissue, blood vessels and altered cancer cells; (3) a zone of normal connective tissue and no cancer cells.

In every patient treated, a radiation up to but not beyond this toleration of the normal tissues should be given so as to take in all the infected area, including the parametria and regional lymphatic territory. This radiation should be made as homogeneous as possible, bearing in mind the underlying physical principles already mentioned.

The most easily injured normal tissue in connection with cervical and vaginal cancer radiation is the rectum. In our earlier cases, when we were less familiar with our agent and totally unacquainted with the tissue reactions, this complication was not uncommon and in some cases led to such serious results as ulceration, fistula formation and even death from infection. Such a complication manifests itself first in from ten days to two weeks after the application, by diarrhea and tenesmus. In the mild types this may disappear in two weeks and no further trouble develop. In the severer grades the proctitis lasts two months or more, then disappears to recur about the beginning of the sixth or seventh month, with ulceration in the anterior rectal wall. This condition is very painful and takes from three to five months to heal. In the worst cases actual fistula formation takes place before healing. *We are happy to state that this complication can be avoided in every case.* We have not seen it for months.

The first radiation should be given in a single dose, following which a pause of at least five or six weeks is necessary before a second treatment is given. During this time the patient should be examined once a week. Some carcinomas, especially the basal celled of the vaginal wall, begin diminishing in a few days and disappear in as short a period as two weeks after the treatment. Most of them begin the decrease at the end of two weeks and continue diminishing for five or six weeks. If at the end of six weeks the growth has disappeared, another four weeks should pass before a second treatment is given. After the second treatment practically all cases in which there will be recovery will show complete disappearance of the growth. In view of the fact that we have seen a number of recurrences developing several months after apparent complete disappearance of the growth, we believe that the radiation should be repeated every few months for a year or two. Some of our permanent successes have been, however, secured from a single radiation.

As a rule, the general symptoms which follow a radiation are mild nausea for twenty-four hours and a sense of weakness for four or five days. Sometimes there are no disagreeable symptoms at all, and in no case has there been any alarming developments. The patients are rarely kept in the hospital longer than the day of treatment.

Every patient before treatment is most thoroughly investigated both from the local and general standpoints, and invariably tissue is secured for microscopic study. The application of the radium sometimes made under nitrous oxid is more frequently made without anesthesia.

Up to the present time we have not found means of determining prior to radiation what its effect will be. The general strength of the patient is not of prime importance. We have seen local disappearances in patients in the last stages of general carcinomatosis. Nor is the extent of local involvement of importance; large growths may disappear and small ones fail to do so. The histologic type is likewise relatively unimportant in this connection; in the cured list are twenty-nine squamous-celled epitheliomas, seventeen basal-celled epitheliomas and seven adenocarcinomas. In passing, we desire to state that squamous-celled epitheliomas may long remain local, and that some basal-celled epitheliomas rapidly metastasize. Among the recurrent cases, it has been noted that those which develop late, two years or more after operation, almost always do well; the cause most likely is connected with immunity factors in the patient.

CLASSIFICATION AND DEFINITION

We have divided our cases into three groups: 1, operable; 2, inoperable; 3, recurrent inoperable. The results obtained have also been placed in three classes: 1*a*, clinically cured; 2*a*, improved; 3*a*, unimproved.

1. By operable cancers are meant those still confined to the cervix or only moderately involving the parametria and vaginal walls. They are not fixed to

the pelvic wall on either side and have not caused hydronephrosis and are not associated with pelvic pain.

2. By inoperable cancers are meant those associated with general metastasis, those firmly fixed to one or both pelvic walls; those extensively involving

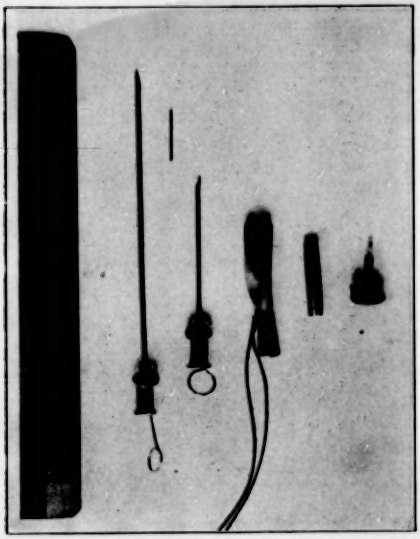

Fig. 1.—Radium applicators and scale indicating size.

the bladder, vagina or rectum. In short, cases in which we have never cured the patients by operation.

3. By recurrent inoperable cancers are meant such recurrences following operation as we have never cured except by radium.

1*a*. By clinically cured is meant the complete disappearance of the cancer so far as palpation, curettage or other method may disclose associated with the apparent perfect general health of the patient.

2*a*. By improved is meant a definite betterment of the patient's condition. In the lesser degrees this may consist of a cessation of hemorrhage and discharge, or a disappearance of pain which has resisted all the drugs, including morphin. Among these, too, are placed twelve cases in which all local trouble disappeared, but the patient showed metastasis at the time of treatment or developed it subsequently. Two of these patients were found locally free of cancer at necropsy, and in two, in whom hysterectomy was carried out after apparent clinical cure, the uteri are clear of the disease, in spite of the fact that both patients are now dead from general metastasis. In most of the cases of this group the reduction in the size of the tumor was marked. It also includes some early cases in which the treatment was very imperfect.

3*a*. By unimproved is meant no material benefit having been produced. Most of these showed histologic improvement on microscopic examination of curettings. In more than two thirds of them the disease was immense and the general condition of patients bad.

All of the patients included in this report were treated prior to January, 1915, and the cured ones were apparently cured at that time. All of the cured have been investigated by one or both of us personally, with a few exceptions in which the examinations were made by competent men. The last report on each case was obtained in May, 1915.

RESULTS

The results obtained by the treatments may be summarized as follows:

Out of the 213 cases treated, 14 were operable and 199 inoperable.

Operable Cases.—Of the 14 operable cases, 10 patients were operated on and treated prophylactically with radium. Of these, 2 have been well for more than three years, 1 for more than two years, 4 for more than a year, and 3 for more than six months. The number is too small to draw conclusions from, and yet is suggestive, when we consider that in 75 per cent. of all cases with operation there is recurrence and that 60 per cent. of these recurrences take place within one year following the operation.

In four cases of the operable group, on account of some general contraindication to operation, radium alone was used. All of this group are living and well; 2 for over three years and 2 for over one year.

Inoperable Cases.—The total number of inoperable and inoperable recurrent cases is 199, of which 53 patients have been clinically cured, 109 markedly improved and 37 not improved.

Our series includes 35 cases of originally inoperable cancer of the cervix uteri or vagina in which the patients are clinically cured; in 2 cases for over four years; in 2 cases for over three years; in 4 cases for over two years; in 17 cases for over one year; in 10 cases for over six months. It also includes 18 cases

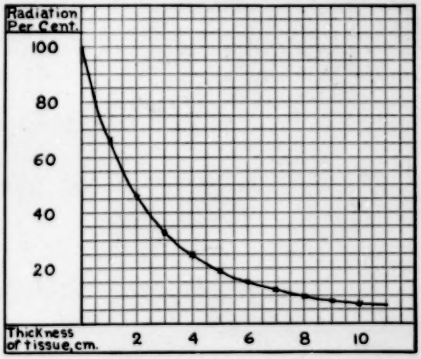

Fig. 2.—Curve showing the variation of the intensity of gamma radiation with the thickness of tissue.

of originally inoperable recurrent cancers in which the patients are now clinically cured; in 1 case for over six years; in 1 case for over four years; in 11 cases for over two years; in 10 cases for over one year; in 5 cases for over six months.

Excluding the operable cases, in which we have both operated and used radium, there are 203 cases left; in

57 of these 203 cases the patients are clinically cured. We employ the word clinically cured and will reserve the word cured for later reports, to apply to cases beyond the five-year limit, which has been conventionally adopted by surgeons as a time limit for estimating the permanency of cures of malignant disease.

Of the 57 clinical cures, 1 has lasted for six years; 3 for over four years; 4 for over three years; 5 for over two years; 29 for over one year, and 15 for over six months.

CONCLUSIONS

We are convinced that radium is of exceedingly great value in the treatment of cancers of the cervix uteri and vagina.

We expect with all confidence that the results in the next 200 cases will far surpass those reported here.

We again emphasize that the betterment in the improved but not cured cases is so marked that it alone makes radium a great addition to existing methods and would justify its use.

We believe that every inoperable cancer of the cervix uteri or vagina, provided general metastasis is not evident, stands a chance of at least 1 in 4 of cure by radium treatment.

There is a marked reason to believe not only that a large number of inoperable cases are curable, but that by the joint use of radium and operation that the 1 in 4 cure rate of operation in operable cases may be raised to 3 in 4 or better.

We have seen that some cervical cancers do not respond to radium treatment. This same variation in

Fig. 3.—Common locations and distances of the cervical and vaginal cancers from the body surface as seen from the side.

reaction occurs in many other types of neoplasm. It is apparently due to a lack in the patient of resistance to the specific growth. Work should be directed toward determining where the body products which attack a radiated cancer arise and what they are. On account of the certainty that some of the operable cancers of the cervix would not be cured by radium and also on account of the necessity of having many patients over five years cured in order to be sure of the permanency of the results, we advise, in operable cases, hysterectomy and radiation. This is the rule in clearly operable conditions. In border-line cases, we advise the use of radium, as the permanent cures from operation are not numerous in this group. If the

Fig. 4.—Common locations and distances of the cervical and vaginal cancers from the body surface as seen from the front.

growth does disappear, it can only be determined whether or not hysterectomy is advisable by trying out both methods; this as yet has not been done in a sufficient number of cases to arrive at any definite conclusions. We do feel, however, that when clinical cures have occurred in inoperable cases, operations are probably best not carried out. Manifestly an inoperable case which becomes operable but does not entirely heal should be treated by operation.

Finally we desire to restate most emphatically that radium can and should be used in these cases without any local or general injury to the patient treated.

1418 Eutaw Place.

Mental Workers and the Heart.—Mental workers do not appreciate at all that they are prone to sudden death from heart failure, particularly after the forty-fifth year of life. Illustrations of this are disclosed all around us every day. Strain and poisoning of intrinsic origin are unquestionably the factors that work with these also. There is a continual upkeep of an increased circulation to the brain, associated with what we believe to be a retarded or sluggish circulation through the eliminative organs. As is well known, this type of worker is also particularly prone to overindulgences in food and drink. There is the same inclination to seek stimulants (coffee and tea must be included here also) as we find among any class of workers who are subject to exhaustion. This particular class, because of the unusual sedentary character of the occupation followed, is least able to digest and eliminate such forms or degrees of food consumption. A peculiar thing, however, is that the appetite of the mental worker appears out of proportion to his caloric or intrinsic requirements.—E. R. Hayhurst, M.D., on Occupational Heart Disease.

THE ACTION OF RADIUM ON CANCERS OF THE PELVIC ORGANS

A CLINICAL AND HISTOLOGIC STUDY *

HENRY SCHMITZ, M.D.
CHICAGO

Since April, 1914, I have treated 112 cases of malignant growths of various regions of the body with radium. Forty-eight of these occurred in pelvic organs. Forty-one of these pelvic cancers are considered in this paper. Thirty-six were in the uterus, five in the rectum and three in the bladder. The tumors were inoperable, recurrent or operable carcinomas. Twenty-four were inoperable, nine recurrent and eight operable.

Ten of the inoperable and three of the recurrent carcinomas were thoroughly cauterized or excochleated and then cauterized preceding the application of radium. Broken-down tissue and débris were thereby as completely removed as possible, and the extent of the intensity of the gamma rays into the depths of the tissues correspondingly increased. The operable cases were subjected to an extensive vaginal cauterization and an abdominal panhysterectomy. As soon as the patient recovered from the operation, radium was inserted into the crater of the broad ligament. The rays were used as a prophylactic to recurrence.

I wish to draw attention to the remarkable deodorizing and purifying action of radium. Those who have attended patients after such abdominal panhysterectomies well remember the sloughing of tissues in the crater of the broad ligament, which gives rise to a terrific putrid odor and discharge and an irregular temperature. One, or at the most two applications of radium stop these distressing complications. The cauterizations always were performed with ordinary soldering irons at red heat.

Fig. 1 (Case 33).—Carcinoma, portio vaginalis, cervix uteri. Low power reproduction of tissue removed Feb. 6, 1915, at beginning of treatment: *a*, squamous cell carcinoma; *b*, connective tissue; *c*, lymphocytic infiltration; *d*, area reproduced in Figure 2.

THE TECHNIC

The technic of applying the radium varied as to the limiting of time of the applications and the kind of metal filters used, but not in the amount of milligrams of radium element applied (uniformly 50 mg.).

Fig. 2 (Case 33).—High power magnification of Area *d* in Figure 1: *a*, carcinoma cells; *b*, connective tissue.

In the beginning of my radium work, the duration of each application was from ten to twelve hours, occasionally twenty-four hours. The interval between the treatments varied from seventy-two to ninety-six hours. These applications were continued until a decided improvement occurred in the subjective as well as the objective condition of the patient. This usually took place after a dosage of from 3,000 to 4,000 milligram hours had been reached. The treatments were then given weekly and finally biweekly, until the condition of the patient warranted a cessation of the treatments. Frequent examinations were insisted on to keep the patient under control. A total dosage of from 8,000 to 10,000 or more milligram hours was thus recorded.

Fourteen patients were treated in this manner (Cases 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18). A subjective improvement was usually noticed after the third application. The pain decreased, the profuse purulent, creamy discharge became scanty and serous, and the hemorrhage ceased. The general state of health improved correspondingly. After about 3,000 milligram hours of radium element had been given (that is, after from about twenty-one to twenty-four days, the bimanual findings became usually normal. In a few cases such a state was not reached until about 6,000 milligram hours had been applied. The uteri which were firmly fixed at the first examination became freely movable and could be plainly outlined. The adnexa were palpable and the crater in the cervix was covered with healthy granulations, being protected by a grayish or whitish membrane. The parametriums also were free of any indurating bands. In other words, by cautious procedures and careful obser-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

vation, we established the fact that on an average from 3,000 to 4,000 milligram hours of radium element were necessary to attain an apparently objective cure.

This knowledge led to the second mode of treatment, which I may term the "intensive method." Just as maximum dosage of Roentgen rays may be concentrated into the possibly shortest space of time, so the milligrammage of radium element might be given within the shortest limit of time, and from 3,000 to 4,000 milligram hours of radium element were applied within from sixty to eighty consecutive hours.

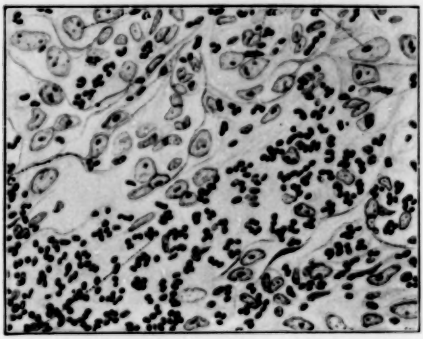

Fig. 3 (Case 33).—High power magnification of tissue removed Feb. 18, 1915, after 2,400 milligram hours of radium element had been applied from Feb. 6 to 8, 1915: *a*, enlarged carcinoma cells; *b*, lymphocytic infiltration; *c*, note connective tissue fibers surrounding groups of carcinoma cells.

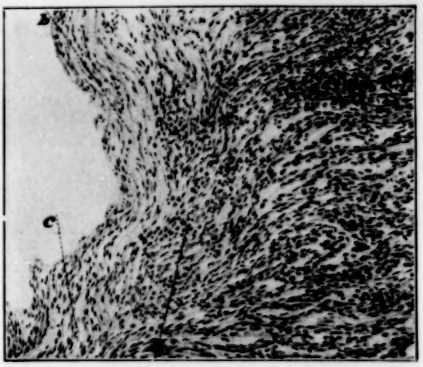

Fig. 4 (Case 33).—Low power magnification of a section of tissue removed Feb. 28, 1915, after 4,800 milligram hours of radium element had been applied from Feb. 6 to 8 and Feb. 18 to 20, 1915: *a*, carcinoma cells; *b*, connective tissue cells; *c*, area reproduced in Figure 5 under high power.

Ten cases in particular (Cases 1, 3, 4, 14, 20, 23, 25, 26, 27 and 28) were thus treated. Although we obtained the same primary results as with the first method, we, however, noted the following points:

1. The apparently objective cure was not reached any sooner than with the first method.

2. The associated symptoms were exceedingly stormy and much severer. They consisted, chiefly, in a marked loss of weight, strength and appetite, with hyperpyrexia, obstinate vomiting, profuse diarrheal stools and obstinate dysuria. Although these symptoms were only transitory, lasting from eight to ten days, the patient suffered much, a condition which we rarely observed in the cases treated by the first or "intermittent method." If such manifestations did occur in this method, they were very mild and of very short duration, lasting usually a day or two.

3. Destruction, ulceration or necrosis of the tissues was of regular occurrence. Repair of these defects was slow. Fistula formation, vesicovaginal, recto-vaginal or even intestinovaginal, occurred in ten cases. However, I wish to state that fistula formation existing at the time of the beginning or taking place during the first few days of the course of the treatment must be ascribed to the extensive cauterization. The damaging action of the radium rays is a contributing cause (Cases 1, 4, 6, 15, 20, 26, 29 and 46), while fistula formation occurring from three to four weeks after the beginning of the radium applications must be directly attributable to the destructive action of radium, and extensive invasion of the bladder or bowel with cancer forms the predisposing cause (Cases 2, 8 and 33).

Fig. 5 (Case 33).—High power magnification of area marked *c* in Figure 4: *a*, area of necrobiotic tissue; *b*, area of connective tissue; *c*, cytolytic carcinoma cell.

Finally, the following plan of treatment was adopted and carried out in the rest of the cases: A course consists of from six to eight séances of from ten to twelve hours each, with an interval of from thirty-six to sixty hours. This course is followed by an intermission of three weeks. If a bimanual examination made at this time reveals an apparent cure, two or

three applications of from 500 to 600 milligram hours of radium element are given every second or third day. Another interval of three weeks is allowed, and if the examination then reveals a normal condition, the treatment is considered terminated. Negative findings, of course, are followed by another course of from 3,000 to 4,000 milligram hours. This "interval method" gave the best subjective and objective results with a minimum of concomitant symptoms, so that I consider it the method of choice.

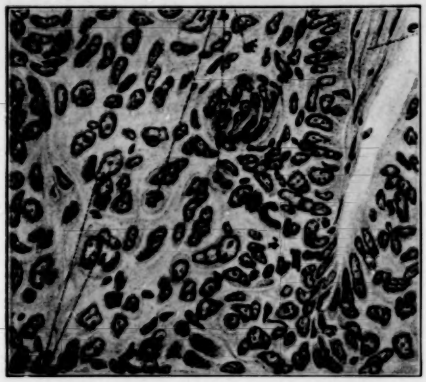

Fig. 6 (Case 39).—High power reproduction of cervical tissue removed March 16, 1915: *a*, nest of carcinoma cells; *b*, karyolysis of nuclei; *c*, granulation of protoplasm; *d*, vacuolation of protoplasm; *e*, connective tissue.

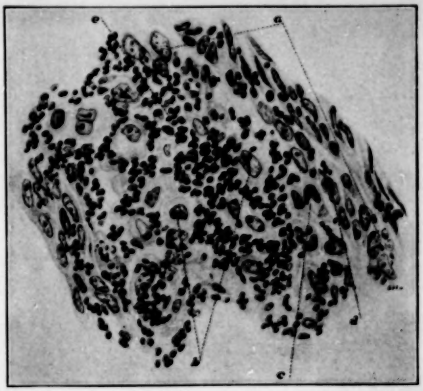

Fig. 7 (Case 39).—High power magnification of tissue removed from center of cervix, March 28, 1915, after 1,600 milligram hours of radium element had been applied from March 20 to 26, 1915: *a*, degeneration of nuclei; *b*, granulation of protoplasm; *c*, degenerating carcinoma cell; *d*, mitosis of cell; *e*, lymphocytes.

Lead filters of 1, 2 and 3 mm. thickness were used in my first work. A 1 mm. filter was deemed sufficient for intra-uterine applications, while the heavier filters were employed in vaginal, rectal and vesical cases. Following the advice of Adler, Werner and others, I soon replaced the lead with brass filters of from 1 to 1.5 mm. thickness. Whether or not the lead filters cause severer latent destructions of tissue than brass filters I am unable to prove. Such disturbances occurred either in very advanced cases of carcinoma, with breaking down uterine or vaginal walls, or in extensively cauterized tumors, as mentioned before. The secondary rays produced in the metal fibers were arrested by surrounding the filter with a cot made of pure Para rubber of a thickness of from 1 to 3 mm. The healthy vaginal walls were protected by snugly packing the vaginal canal with gauze, Para rubber or lead plates surrounded by rubber and gauze.

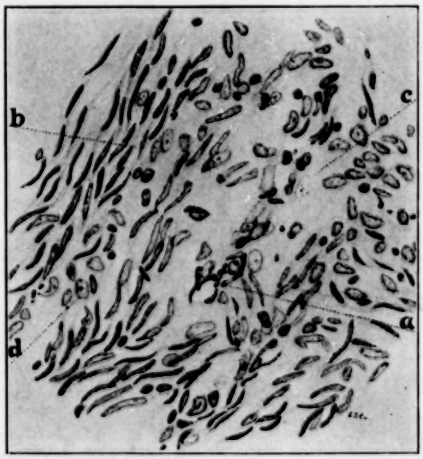

Fig. 8 (Case 39).—High power magnification of tissue removed April 7, 1915, after 3,700 milligram hours of radium element had been applied from March 26 to April 4, 1914: *a*, macrophagia-connective tissue cells; *b*, connective tissue cells; *c*, necrobiotic carcinoma cell; *d*, vacuolation of protoplasm.

CLINICAL RESULTS

Tables 2 to 5 show at a glance the results of the radium treatment. The amount of the milligram hours of radium element used, and beginning and duration of the treatment and the present condition are enumerated for each case. Of the ten cases of Table 2, one case was refractory, and nine cases evidenced a subjective and an objective improvement. Objective improvement indicates negative findings on bimanual palpation. Five of this group have succumbed to the disease. One has remained well since April, 1914, one since October, 1914, and one since January, 1915. Two cases, 39 and 40, are of too recent date to permit an expression as to the remote results. The primary results in these cases, however, are very good. Three of these patients (Cases 12, 16 and 18) were subsequently subjected to an abdominal panhysterectomy.

Fourteen inoperable cases, enumerated in Table 3, were treated only with radium. They were far advanced or extremely cachectic cases or had constitutional manifestations contraindicating even a cauter-

ization. Ten have died or are slowly succumbing to the disease. Four are free of all objective and subjective symptoms. They, and three cases not yet listed, were treated only recently; and considering the poor results obtained in the other ten cases, I must withhold a final opinion. One case (Case 14) had, after the completion of radium treatment, a panhysterectomy.

Of the nine recurrent carcinomas, listed in Table 4, five show an entirely refractory behavior toward the radium rays. Four revealed a subjective and three also an objective improvement. One of the latter patients died eight months after the beginning of the treatment from an intercurrent disease. She had had a recurrence the size of a pea, which disappeared after

TABLE 1.—CANCERS OF PELVIC ORGANS TREATED WITH RADIUM

Case No.	Name of Patients	Hospital Number	Age, Yrs.	Date of Adm.	Uterine	Rectal	Vesical	Milligram Hours Radium Element	Operable	Recurrent	Inoperable		Remarks
											Cauterized	Not Cauterized	
1	Mrs. B.	Augustana.....	41218	51	9/24/14	+	..	..	4,300	+			
2	Mrs. H.	Augustana.....	40698	49	5/22/14	+	..	..	9,525	..	..	..	+	Cauterization 11/3/14.
3	Mrs. H.	Augustana.....	40717	61	7/23/14	+	..	..	10,250	..	+	..	..	Op. four years ago.
4	Mrs. R.	Augustana.....	40944	59	8/25/14	+	..	..	6,775	+				
5	Mrs. D.	Augustana.....	39516	32	3/23/14	..	+	..	9,000	..	..	..	+	
6	Mr. E.	Augustana.....	40405	74	6/29/14	..	..	+	3,150	+				
7	Mr. J.	St. Mary's.....	25176	57	6/30/14	..	+	..	2,175	+				
8	Mrs. K.	St. Mary's.....	24658	38	3/13/14	+	..	..	5,700	..	+	..	..	Cauterization 9/16/13.
9	Mrs. K.	Augustana.....	39778	66	4/22/14	+	..	..	6,320	..	..	+		
10	Mrs. McQu.	Augustana.....	39516	29	3/23/14	+	..	..	3,375	..	+			
11	Mrs. McC..	St. Mary's.....	24096	47	3/17/14	+	..	..	7,500	..	..	+		
12	Mrs. M.	St. Mary's.....	23657	52	3/ 7/14	+	..	..	7,875	..	..	+	..	Became operable.
13	Mrs. P.	Augustana.....	40570	63	6/11/14	+	..	..	2,575	..	+			
14	Mrs. R	Augustana.....	40202	42	6/ 4/14	+	..	..	9,250	..	..	..	+	Became operable.
15	Mrs. C. S. .	Willard Hosp. ...	.....	52	4/ 4/14	+	..	..	8,312	..	..	..	+	Care. corp. uteri.
16	Mrs. Th. ...	Augustana.....	39321	53	3/ 4/14	+	..	..	9,043	..	..	+	..	Became operable.
17	Mrs. V.	Augustana.....	39755	64	4/19/14	+	..	..	3,325	+	..	..	..	Also cauterization.
18	Mrs. W.	Augustana.....	39469	35	3/19/14	+	..	..	8,700	..	..	+	..	Became operable.
19	Mrs. W.	Augustana.....	40568	48	7/14/14	+	..	..	3,750	..	..	..	+	
20	Mrs. P.	Augustana.....	40456	45	7/4/14	+	..	..	3,500	..	+			
21	Mrs. J.	Augustana.....	40349	26	6/22/14	..	+	..	1,125	..	..	..	+	
22	Mrs. R.	Augustana.....	41305	32	10/ 7/14	+	..	..	4,000	..	..	+		
23	Mrs. Sk.	Augustana.....	41221	53	9/25/14	+	..	..	6,800	..	..	+		
24	Mrs. B.	Washington Bvd.	8868	52	10/17/14	+	..	..	4,150	+	..	..	..	Care. corp. uteri.
25	Miss Ro. ...	Washington Bvd.	8862	53	10/ 1/14	+	..	..	9,875	..	..	..	+	
26	Mrs. H.	Augustana.....	41612	52	11/21/14	+	..	..	2,300	..	+	..	..	Cauterized 11/22/14.
27	Mrs. M.	West Side.....	28685	48	11/27/14	+	..	..	4,150	..	..	..	+	Sarcomatous myoma ?
28	Mr. St.	St. Mary's.....	26857	52	12/29/14	..	..	+	3,600	..	..	..	+	
29	Mrs. T.	Augustana.....	41944	49	1/ 5/15	+	..	..	3,500	..	..	+		
30	Mr. To.	St. Mary's.....	27696	58	1/23/15	..	..	+	2,400	..	..	..	+	
31	Mr. A. M. ..	Willard.....	.....	52	2/10/15	..	+	..	4,500	..	..	..	+	
32	Mrs. M.	Augustana.....	42319	42	2/15/15	+	..	..	5,175	..	+			
33	Mrs. H.	Post-Graduate...	.....	43	2/ 6/15	+	..	..	4,800	..	..	..	+	Colored.
34	Mrs. H.	St. Mary's.....	27533	33	3/ 3/15	+	..	..	2,800	..	+			
35	Mrs. C.	St. Mary's.....	27580	52	3/ 9/15	+	..	..	3,900	..	+			
36	Mrs. L.	Augustana.....	42538	60	3/ 9/15	+	..	..	2,925	..	..	+		
37	Mrs. W.	Norwegian Deaconess..		63	3/ 7/15	+	..	..	1,700	..	..	..	+	
38	Mrs. J.	St. Mary's.....	27560	36	3/ 5/15	+	..	..	2,250	+				
39	Mrs. Sl.	St. Mary's.....	27649	65	3/15/15	+	..	..	3,700	..	..	+		
40	Mrs. DeR. .	St. Mary's.....	27978	56	4/14/15	+	..	..	5,650	..	..	+		
41	Mrs. St. A.	St. Mary's.....	27962	49	4/15/15	+	..	..	3,950	+				

TABLE 2.—INOPERABLE CANCERS TREATED WITH CAUTERIZATION AND RADIUM

Case Number	Cause of Inoperability	Date of Cauterization	Total Mg. Hrs. of Radium Element Applied	Duration of Treatment	Primary Results			Further Treatment	Results and Present Condition
					Refractory	Subjective Improvement	Objective Improvement		
9	Involvement of bladder and parametrium	4/23/14	6,320	5/12/14 to 7/ 5/14	....	Yes	....	None.....	Died from bladder and vulva invasion.
11	Involvement of bladder and rectum	3/18/14	1,750 3,200 2,550	4/14/14 to 4/23/14 6/17/14 to 7/23/14 8/12/14 to 8/23/14	....	....	....	.....	Died. Patient after remarkable primary result neglected to return until June. Radium now refractory.
					....	Yes	....	None.	
12	Extensive involvement of parametrium and rectum	3/ 8/14	7,875	4/ 2/14 to 6/11/14	....	Yes	Yes	July 14, 1914. Abdominal panhysterectomy	Died Dec. 30, 1914 from invasion of rectum.
16	Involvement of parametrium	3/ 5/14	9,043	4/ 1/14 to 9/ 9/14	....	Yes	Yes	April 24, 1914. Abdominal panhysterectomy	Well. Pelvis normal.
18	Marked cachexia...	3/20/14	8,700	4/ 1/14 to 7/31/14	....	Yes	Yes	.....	Died August, 1914 from invasion of bladder and exhaustion.
22	Extensive involvement of vaginal vault	10/ 8/14	4,000	10/17/14 to 10/22/14	Yes	....	....	.....	Died December, 1914 from exhaustion.
23	Extensive involvement of vagina and parametrium	9/26/14	6,800 1,200	10/19/14 to 11/ 1/14 2/ 9/15 to 2/11/15	....	....	....	.....	Well. Pelvis normal.
					....	Yes	Yes		
29	Involvement of anterior vaginal wall	1/ 6/15	3,500	1/21/14 to 1/24/15	....	Yes	Yes	Repair of vesicovaginal fistula March, 1915	Well except fistula.
39	Involvement of parametrium	2/16/15	3,700 850	3/20/15 to 4/ 4/15 4/26/15	....	Yes	Yes	.....	June 11, 1915; metastasis of right inguinal glands.
40	Involvement of bladder and parametrium	4/ 7/15	5,650	4/15/15 to 5/ 6/15	....	Yes	....	.....	Panhysterectomy could not be completed. Supravaginal amputation.
36	Pyometra; involvement of parametrium	3/10/15	2,925	3/12/15 to 3/23/15	....	Yes	Yes	.....	

radium treatment and cauterization. Another patient after a successful primary result did not return for a reexamination, and has not been heard from. The third one has again a healthy vagina, and the pelvis is free from indurating masses, though the entire vaginal canal was a mass of carcinomatous growths extending up into the base of the right broad ligament and down into the fourchet.

Of the eight operable cases (Table 5) treated by surgery and radium, one patient died nine months afterward from a metastasis of the liver, another one two months later from a severe hemorrhage from the vagina. The others are at this time in a normal condition and do not show a recurrence. The average time which has elapsed since the operation is eight months.

TABLE 3.—INOPERABLE CANCERS TREATED ONLY WITH RADIUM

Case Number	Cause of Inoperability	Total Mg. Hrs. of Radium Element Applied	Duration of Treatment	Primary Results			Further Treatment	Result and Present Condition
				Refractory	Subjective Improvement	Objective Improvement		
2	Extensive involvement of vagina	9,525	5/30/14 to 9/24/14	....	Yes	....	.....	Cauterization Nov. 3, 1913. Has vesicovaginal fistula; cachectic.
5	Involvement of entire vagina, rectum, vulva	9,900	6/ 1/14 to 8/19/14	Yes	....	....	.....	Had colostomy. Died from exhaustion.
14	Involvement of right ureter and sigmoid	9,250	6/ 7/14 to 8/ 5/14	....	Yes	Yes	.....	Aug. 5, 1914, abd. panhysterectomy; resection of sigmoid. Died Nov. 20, 1914, from carcinomatosis.
15	Involvement of parametrium and rectum	8,312	4/ 4/14 to 6/17/14	....	Yes	....	.....	Oct. 10, 1913, colostomy. Died Jan., 1915; cancer of liver.
19	Chronic endocarditis with decompensation	3,750	7/19/14 to 8/ 9/14	Yes	....	....	.....	Died, August, 1914, from endocarditis
21	Extensive involvement of rectum	1,125	7/29/14 to 8/ 8/14	Yes	....	....	.....	Patient refused further treatment on account of rectal tenesmus caused by radium; had colostomy; died.
25	Cachexia and local extension of tumor	8,875	11/ 6/14 to 12/ 5/14	Yes	....	....	.....	Died.
27	Pyosalpinx and involvement of abdominal organs	4,150	11/27/14 to 12/ 3/14	Yes	....	....	.....	Died.
28	Extensive involvement of bladder	3,600	12/31/14 to 1/25/15	....	Yes	Yes	Dec. 31, 1914, cystotomy for insertion of radium	Died January, 1915, from exhaustion after hip amputation for path. fracture of femur due to metastasis.
30	Extensive involvement of bladder	2,400	1/31/14 to 2/ 2/15	....	Yes	Yes	Jan. 25, 1915, exploratory cystotomy	Bladder free from tumor mass; gained in weight and strength.
33	Cachexia; vagina and bladder invaded	4,800	2/ 6/15 to 2/22/15	Yes	....	....	.....	Developed vesicovaginal fistula; refused to continue treatment. Died.
36	Pyometra.....	2,925	3/12-23/15 to 3/22/15	....	Yes	Yes	.....	Cervix now normal.
37	Involvement of bladder	1,700	3/15/14 to 3/20/15	Yes	....	....	March 8, 1915, exploratory laparotomy	Had a thrombophlebitis. Exacerbation. Died from septicemia.
31	Extensive involvement of rectum	4,800	2/12 to 4/ 2	....	Yes	Yes	.....	Rectum normal and freely movable. Returned to work.

TABLE 4.—RECURRENT CANCERS

Case Number	Date of Primary Operation	Character of Operation	Date of Recurrence	Condition of Pelvic Organs	Total Mg. H. of Radium Element Applied	Duration of Treatment	Primary Results			Remarks and Results
							Refractory	Subjective Improvement	Objective Improvement	
3	July, 1910	Vaginal panhysterectomy	June, 1914	Nodule and ulcer size of bean in vaginal vault	10,350	7/27/14 to 11/20/14	....	Yes	Yes	Patient succumbed to an intercurrent disease, March, 1915; cauterization 7/31/14.
8	Jan. 9, 1913 Sept. 16, 1913	Abd. hysterectomy Vag. cauterization	Sept. 1913	Involvement of entire vagina	5,700	4/ 6/14 to 5/28/14	....	Yes	....	Vesicovaginal fistula. Died Sept. 21, 1914, from exhaustion.
10	Oct. 1913	Vag. hysterectomy	Oct. 1913	Involvement of vagina, vulva and perineum	3,375	4/25/14 to 5/13/14	Yes	....	....	Septicemia after third radium treatment. Died May, 1914.
13	May	Vag. hysterectomy	Apr. 1914	Involvement of entire vagina	2,275	6/13/14 to 6/15/14	....	Yes	Yes	Vagina healed immediately; did not return for treatment.
20	Aug. 12, 1912	Vag. hysterectomy, salpingo-oophorectomy sinistra	Mar. 1914	Mass involving right adnexa	3,500	7/10/14 to 7/13/14	Yes	....	....	Developed vesicovaginal intestinovaginal fistula; succumbed to exhaustion August, 1914.
26	Sept. 2, 1914	A b d. panhysterectomy	Nov. 1914	Ulcer in vaginal vault	2,300	11/25/14 to 11/25/14	Yes	....	....	Nov. 23, 1914, cauterization of vag. vault; developed intestinal fistula; died Dec. 27, 1914; exhaustion.
32	Oct. 1913	Vaginal hysterectomy	Apr. 1914	Ulcer in vaginal vault involving right parametrium and bladder	5,175	2/15/15 to 3/22/15	Yes	....	....	April 20, 1915, tumor increasing in size; patient loses weight and strength; has much pain.
34	Fall, 1914	A b d. panhysterectomy	.....	Mass involving vag. vault extending to right up to brim	2,800	3/ 9/15 to 3/20/15	Yes	....	....	Losing weight and strength.
35	March, 1914	Vag. and abd. panhysterectomy	Aug. 1914	Ulcer involving entire vagina and right parametrium	3,900	3/10/15 to 4/ 6/15	....	Yes	Yes	April 30, 1915, vagina and vulva normal and free of any nodular masses.
45	4/25/15 6/19/15	Percy cautery Abd. hysterectomy	Never; compl. recovery	Crater involving parametriums	3,950	6/ 1/15 to 6/12/15	....	Yes		

HISTOLOGIC FINDINGS

The action of the gamma rays on carcinoma tissue has been studied in eight cases, namely, six uterine (Cases 12, 14, 16, 24, 29 and 39); one rectal (Case 31), and one skin cancer (Case 85). The latter has been added, as it affords a particularly favorable instance for the study of the changes occurring in carcinoma cells by the action of radium. The reproductions of the first microscopic sections (Figs. 1 and 6) were made from tissues removed from the tumor before the beginning of the radium treatment. The time of removal of the other sections is stated beneath each illustration; also the amount of radium element applied preceding the removal of the sections, and the time duration of the application of each course.

The histologic changes may be divided into four stages:

The first stage is characterized by an enlargement of the carcinoma cells, a hyperchromatosis and a pyknosis of the nuclei. They are evident in all the cases examined. These changes usually occur within about ten days after the first application of radium (Figs. 3 and 7).

In the second stage we observe karyolysis, karyorrhexis, cytolysis and cell detritus. Figure 3 shows many evidences of such changes. They are observed as early as from the first to the third week of the treatment.

The third stage shows an absorption of the cellular and nuclear débris by phagocytes. Macrophages and microphages are concerned in this step. Microphagic activity is highly evident in Figure 3, while macrophages are seen to be active in Figure 8.

The fourth stage is the stage of connective tissue proliferation and scar formation. It completes the histologic cure of cancer. The places left vacant by the dead carcinoma cells are immediately filled by young fibroblasts derived from the connective tissue stroma of the tumor. The fibroblasts become differentiated. Figure 4 shows the connective tissue regeneration. The fourth stage appears usually after from the first to the third month, but may occur much sooner.

A difference frequently exists between the clinical results and the histologic findings. For instance, in Case 12 there was evidence of a completely destroyed cancer tumor, yet the patient succumbed to a bowel invasion, proving that some cancer cells either remained uninfluenced by the radium or regenerated after the subsidence of the action of the rays. Therefore, certain questions arise which call for definite answers before we can positively state that radium rays cause a degeneration and ultimate death of cancer tissue and a simultaneous regeneration of connective tissue.

1. Are we able by histologic examination to differentiate the necrobiotic changes in the carcinoma cells brought about by natural and artificial conditions from those caused by the influence of radium rays? It is evident that we cannot do so. Cells undergo necrobiotic changes in the course of their existence. Heat, caustics and alcohol, brought in contact with the tissues, may produce the same changes, as is well known. However, such general and extensive changes as seen in these specimens, the absence of cell degeneration as evidenced in the first sections, and, finally, the regularity of their occurrence in all the tissues investigated, even in those not previously cauterized, permit us to state that they must be caused by the action of the gamma rays.

2. Can we, by examination of small pieces of tissue removed from the growth, determine the extent and intensity of the action of radium rays? We cannot from such an examination, but could do so from serial sections of all the organs removed either intra vitam during operations, or, preferably, postmortem.

I have, fortunately, four cases in which an abdominal panhysterectomy was performed after a clinical cure of the cancer by the use of radium rays was obtained (Cases 12, 14, 16 and 24). Serial sections were made from the tissues removed. A microscopic examination revealed that the cytolytic changes were generally present throughout the organs removed. This does not prove that distantly located foci were not left behind. As a matter of fact, Patients 12 and 14 died subsequently from cancer. This shows that viable cancer cells were left behind somewhere in the pelvis. Bumm examined tissues acted on by gamma rays and removed afterward during postmortem examinations. He estimated that the intensity of the gamma rays

TABLE 5.—CANCERS TREATED BY SURGERY AND RADIUM

Case Number	Date of Operation	Character of Operation	Complications of Convalescence	Mg. Hrs. of Radium Element Applied	Duration of Radium Treatment	Result	Remarks and Present Condition
1	9/25/14	Abd. panhysterectomy; vag. cauterization	Vesico-abd. and vesicovag. fistula	4,400	10/10/14 to 10/26/11	Perfect recovery	Died two months afterward from a vaginal hemorrhage.
4	8/26/14	Vag. cauterization; abd. panhysterectomy	Vesicovaginal fistula	6,775	9/ 6/14 to 10/13/14	Recovery,but fistula	Well, April, 1915; fistula closed.
6	7/17/14	Perineal cystotomy and cauterization	None	3,150	8/ 3/14 to 9/ 1/14	Recovered.	
7	7/ 2/14	Resection of 8" of rectum; perineal operation	None	2,175	7/16/14 to 8/ 1/14 and 10/30-31/14	Recovered....	Dying from metastatic cancer of liver.
17	4/20-24/14	Vag. cauterization; abd. panhysterectomy	None	3,525	5/15/14 to 5/30/14	Recovered.	
24	10/20/14	Abd. panhysterectomy...	None	4,150	10/21-23 and 11/11-13/14	Recovered....	Oct. 21, 1914, diagnostic curettage; well.
28	3/16/15	Abrasion of mucosa; amputation of cervix.....					
	3/16/15	Abdominal hysterectomy	None	2,550	3/21 to 3/28/15	Recovered.	
41	4/16/15	Vag. cauterization; abd. panhysterectomy	None	3,950	4/19 to 5/4	.....	Extensive involvement of anterior vaginal wall. Really an inoperable case; impossible to remove entire growth.
44	5/20/15	Abd. panhysterectomy; cauterization	None	4,000	5/23-31/15	.....	Extensive involvement of right parametrium; impossible to remove entire tumor mass.

sufficient to destroy carcinoma tissue extended into a radius of 4 cm. Within this area of intensity, carcinoma cells were not found present; beyond it, however, typical unchanged cancer cell nests were still found to exist. In other words, extensive carcinoma growths are only partially destroyed by gamma rays. This area of destruction, however, has a diameter of 8 cm., and enables us to reach tissues which a knife could never remove.

3. Is it possible by such microscopic examinations to state whether a carcinoma cell has perished or whether it might not regenerate after the action of the radium rays ceases? The following citation will illustrate the answer to this question: Chéron and Rubens-Duval treated a patient suffering from an inoperable carcinoma of the cervix with radium during November, 1910, and January, 1911. The patient was apparently clinically cured. She died from an intercurrent disease (a cerebral softening) during April, 1912, fifteen months after the beginning of the radium treatment. All the internal organs and tissues were removed postmortem, and a careful serial histologic examination of all the tissues did not reveal a single carcinoma cell at any place of the organism. A complete anatomic cure by radium rays has thus been demonstrated.

My investigations demonstrate the uniformity and general extent of the necrobiotic changes brought about in the carcinoma cells by the action of the gamma rays. Bumm's researches fix the extent of the area of intensity of the rays within which a carcinoma will become destroyed, and Chéron and Rubens-Duval's case proves the capability or efficiency of the radium rays to bring about an anatomic cure of cancer.

CONCLUSIONS

1. The best method of applying radium is the interval method by which from 3,000 to 4,000 milligram hours of radium element are applied within from about fourteen to twenty-one days.

2. The alpha and beta rays must be arrested by a brass filter of from 1 to 1.5 mm. thickness.

3. The secondary rays, forming in the metal filter, are rendered inert by a rubber cot of from 1 to 3 mm. thickness.

4. Inoperable cancers that are not far advanced so that cauterization is not contraindicated yield satisfactorily to radium therapy.

5. Advanced inoperable and recurrent cancers are ordinarily refractory toward the radium rays. Any improvement is at least very temporary.

6. The patients treated with the rays after surgical removal of the organs have done well, although the time elapsed since the treatment averages eight months.

7. Patients suffering from cancer should be treated surgically and then radiologically, and if surgery is contraindicated they should receive radium treatment, which at least relieves the subjective symptoms and often the objective ones.

8. The time elapsed since the commencement of the radium treatment in all the cases enumerated is too short to permit definite opinion as to the remote results of radium treatment.

9. Clinical and histologic studies enable us to pronounce the radium rays a valuable addition to the therapy of cancer.

10. It will require years of constant observation to demonstrate such results as anatomic cures.

11. The same measure that is applied to establish the efficacy of surgical procedures in cancer treatment must certainly be employed in radiotherapy.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BURNAM AND KELLY, AND SCHMITZ

DR. J. F. PERCY, Galesburg, Ill.: Ewing of New York said a few years ago that the balance in cancer is easily upset; and this must be true, because there are a number of methods of destroying or inhibiting cancer that have a certain number of clinical cures to their credit. It would be interesting if we could go back in a historical way to these various methods and determine just how much they have accomplished. One thing has been brought out by both of these papers, and that is the totally inexplicable way some cases are clinically cured and other cases apparently of the same type are either made worse or not affected by the same treatment. The problem of the treatment of inoperable cancer of the uterus has always been of the gross mass, and it is a question whether or not radium, in the great mass of cancer usually seen in the cervix, is as valuable as some other method that will at once, or in a comparatively few minutes, get rid of this gross mass. Another problem is the metastasis, and I am glad that both the essayists have mentioned an immunity, or, at least, suggested it. This immunity is undoubtedly developed in greater or less degree, and without doubt takes care, in many cases, of the metastases after the destruction of the gross mass. At least I am convinced of this from my own experience. I am especially interested in the destruction of the gross mass by heat. I am convinced that this method is the most certain of any of the methods that have been brought to our attention. In addition, it does not require specialized judgment and the apparatus required is comparatively inexpensive. One of the difficulties of radium and the Roentgen ray in attacking the gross mass of cancer is that they break down a lot of cancer cells, and if drainage is not provided, an overdose of the broken-down cancer cells may be absorbed and kill the patient. In other words, even with radium or the Roentgen ray, if one attacks the gross mass he must provide for some form of drainage. This is easily done with the heat technic. It is not easily done with either radium or the Roentgen ray.

DR. S. M. D. CLARK, New Orleans: The two papers show definitely that we are not marking time in the warfare on cancer. We are beginning to see rays of light, and I feel confident that if the present pressure is kept up, our results will progressively improve. I am sorry that I cannot discuss the subject from the radium point of view, but since I note that the best results obtained by one of the essayists was when using the radical operation after the growth had been transformed by using radium, it seems appropriate to consider cancer of the uterus from another angle.

Though the Percy heat method has great merit, still when viewed in the light of a cure, it falls short and is to be looked on more as an adjunct or link in the chain of treatment. Time is too short to go into the detail of my combination method, but its chief point rests in being able to transform inoperable into operable cases by performing the work as a two-stage operation. At the first sitting the abdomen is opened and both internal iliacs and one ovarian artery are tied, primarily for the purpose of starving the growth, as well as to control secondary hemorrhage. Heat is applied at the same time. After three to five weeks' interval the patient is transformed constitutionally and locally, when the radical removal is done. This method increases operability and decreases the primary mortality. If we keep accurate records of our work, in ten years stock can be taken of our results, and the best method adopted.

DR. HENRY SCHMITZ, Chicago: It is a question of developing first the therapy, and second the technic of the application of radium. If we do know the amount and the manner in which we should use it, our results will improve. My first cases treated were not so successful as at present. I feel

that radium will do more in the eradication of cancer than any other means. I have applied surgery, heat and everything I possibly could use, but since I have been using radium I feel more confident of benefiting my patients.

Dr. Curtis F. Burnam, Baltimore: I omitted one thing that I intended to say, that in the beginning we catheterized and curetted our b.g masses. More recently we are not doing that. So far as I know, there is no general upset in the treatment. We give a single treatment, and repeat it in six weeks if the growth is still there. If it has gone, we wait three months; but if it has not gone we repeat; and the patient rarely stays in the hospital longer than the day of treatment.

THE ROENTGEN-RAY TREATMENT OF SKIN DISEASES *

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NEW YORK

THE DERMATOLOGIST AND THE RADIOLOGIST

Now that Roentgen-ray work is becoming highly specialized, there seems to be a tendency to separate

Fig. 3.—A group of hypertrophic lichen planus papules on the wrist. Also two common warts, one on the little finger and one at the base of the index finger.

dermatology from roentgenotherapy. This is both desirable and undesirable. So far as concerns the Roentgen-ray treatment of skin diseases, two general attributes are essential — a knowledge of dermatology and skill in modern Roentgen-ray technic. The dermatologist possesses the former and he can easily acquire the latter, for the difficulties are more imaginary than real. The pure roentgenologist, while being expert in Roentgen-ray technic, lacks a dermatologic training, as also do many of the physicians who refer patients to him for treatment. To avoid errors in diagnosis and the obvious consequences, it would seem advisable to adhere to one of three schemes: for the dermatologist to employ the Roentgen ray; for the roentgenologist to have at least a clinical knowledge of dermatology; or for both to combine their skill in behalf of the patient.

TECHNIC

In a short, practical paper of this kind it is not possible actually to describe a technic. A general outline of modern methods may, however, be of interest. Two methods are in vogue at the present moment, namely, intensive and divided doses.

Intensive Method.—Here the quality of the ray used is ascertained by direct measurement (Benoist, Walter or Wehnelt instruments), while it is maintained by means of indirect measurement (milliamperemeter, spark-gap, etc.). The quantity is measured directly, through the employment of reliable radiometers such as those originated by Holz-

Fig. 4.—Same as Figure 3 after one dose of H 4, B 9 was applied to the lichen lesions. Note the area of temporary pigmentation at the wrist. Note also that the warts have disappeared without having been exposed to the ray.

knecht and Corbett. In this way every dose is estimated as accurately as modern science will allow. An intensive treatment may consist of enough rays to produce a second degree Roentgen dermatitis, a simple erythema, a loss of hair without erythema, or a dose that is too small to produce a visible effect on the normal skin, but yet too large to allow of its repetition within three or four weeks. The method is thoroughly established and is sufficiently accurate for all practical purposes. No better example of its accuracy can be demanded than the excellent results associated with the intensive Roentgen-ray treatment of ringworm and favus of the scalp.

There is a difference of opinion regarding the quality of ray to be employed in different cutaneous diseases. Contrary to

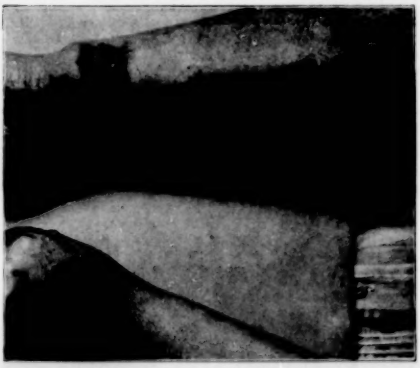

Fig. 5.—Chronic eczema with acute exacerbations.

the general consensus, I have found a "hard" ray (B 8 to 10) preferable for routine work and seldom use a ray of lower penetration.

In considering the quantity, the question of idiosyncrasy and susceptibility should be discussed. True idiosyncrasy must be a very rare phenomenon. Again I direct attention to thousands of cases of tinea tonsurans that have been treated

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* Read before the Section on Dermatology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

* On account of lack of space this paper has been abbreviated for The Journal. It will appear in full in the Transactions of the Section and in the author's reprints.

with intensive Roentgen radiation without a single example of idiosyncrasy having been encountered. As a matter of fact, as an operator becomes more expert and experienced he

Fig. 6.—Same as Figure 5 after three treatments at weekly intervals, totaling about H 6, B 9.

employs the term less frequently. I do not deny the possibility of true idiosyncrasy—it undoubtedly does exist—but it is extremely uncommon. Hypersusceptibility, on the other hand, is very common. Some parts of the body are more

Fig. 11.—Painful plantar wart of 4 years' duration.

sensitive than others. The skin of aged individuals will tolerate larger doses than will the integument of children. Chemicals, such as iodin, tar, mercury, chrysarobin, salicylic acid, etc., will markedly enhance the action of the ray. The skin of individuals suffering from certain diseases—mycosis

Fig. 12.—Same as Figure 11 after two intensive treatments, each of which consisted of H 6, B 9.

fungoides, goiter, eczema, psoriasis—may be hypersensitive. The intensive dose will vary in amount according to the effect desired and the disease treated. In epithelioma, it will be in the neighborhood of 8 or 10 Holzknecht units; in keloid, from 4 to 6 units; tinea tonsurans, 4 to 5 units; eczema and psoriasis, 2 to 3 units, etc.

Fig. 13.—Multiple common warts.

Divided Method.—The divided technic is not as accurate and in some diseases it is not nearly as efficacious as is the intensive method. In fact, there are diseases, such as epithelioma and tinea tonsurans, in which the divided method may even prove injurious. On the other hand, in diseases in which stimulation is beneficial (eczema, psoriasis, etc.) it is as good if not actually superior to intensive treatment. In speaking of the divided method it must be recognized that we

Fig. 14.—Same as Figure 13 after one treatment consisting of H 4, B 9.

are dealing with a modernized technic and not with former obsolete methods in which from 50 to 200 exposures were administered in the treatment of an epithelioma. As a matter of fact, the divided method of today, when compared with older technics, is decidedly intensive.

Briefly the technic is as follows: Certain fixed indirect factors are established and used as "constants." That is to

Fig. 17.—An exceedingly hard keloid following an electric burn.

say, the anode of the tube is always at the same distance from the skin; the milliamperage, the spark-gap distance, the length of the conducting wires, the speed of the motor, the transformer cycle, the rheostats, and, in fact, all adjustable

parts are always employed in exactly the same manner for every treatment. Now, with all these "constants" established the time necessary to produce the so-called pastille or erythema dose (about 5 H) is ascertained. Let us assume

Fig. 18.—Same as Figure 17 after five intensive treatments totaling H 40, B 9, filtered through 3 mm. of aluminum.

that the required time is twenty minutes. This may be divided into four treatments of five minutes each or eight treatments of 2½ minutes each, and administered at intervals of from

Fig. 21.—Dermatitis papillaris capillitii (acne keloid) in a negro.

three to seven days, so that the full erythema dose is given in the course of one month.

There are several technics for the divided method; it will

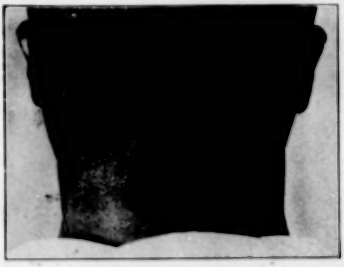

Fig. 22.—Same as Figure 21 after treatment. The lesions were unusually obstinate, and require I ten intensive treatments totaling H 50, B 9. The treated skin was depigmented, a defect corrected by using a cutaneous stain.

vary according to the apparatus employed, and, also, in accordance with the training, skill and experience of the operator. Personal equation is an important factor.

DISEASES AMENABLE TO ROENTGEN-RAY TREATMENT

Inflammations

Erythema Induratum (Bazin's Disease). — This affection, now known to be a true but benign type of

Fig. 25.—Hypertrophic lupus vulgaris returning after operation.

Fig. 26.—Same as Figure 25 after one intensive Roentgen-ray treatment.

cutaneous tuberculosis, yields readily, as a rule, to the Roentgen ray. One intensive (suberythema) dose will usually suffice to produce a cure in the ulcerative type of the disease. The subcutaneous nodules are more rebellious. Rest, hygiene, tonics, etc., will usually

Fig. 32.—Ulcerating basal-cell epithelioma with considerable induration of margin.

Fig. 33.—Same as Figure 32 after one intensive treatment consisting of H 8, B 9. Treated three years ago—no relapse.

suffice to cure this disease in a few months, but in stubborn cases the Roentgen ray is of considerable service.

Granuloma Annulare.—I have treated only one case of this disease. The patient presented numerous tumors on the hands, arms and ears. Each lesion

Fig. 34.—Ulceronodular epithelioma of inner canthus—a favorite situation and a difficult position for operation.

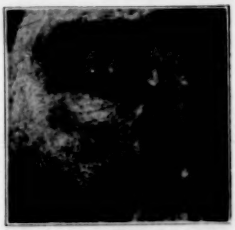

Fig. 35.—Same as Figure 34 after one intensive treatment of H 8, B 9. Treated three years ago—no relapse.

disappeared under the influence of a single treatment of 4 H units of a B 9 ray — in other words, a suberythema dose. The Roentgen ray, of course, will

have very little if any influence on the future course of the disease.

Prurigo.—Small doses of the Roentgen ray produce favorable effects in this recalcitrant juvenile affection, chiefly through its antipruritic powers. It does not materially alter the course of the disease. The divided-dose technic is indicated here and after one course of treatment an interval of several months should elapse before another course is given in order to avoid possible injury to the epiphyses.

Fig. 38.—Squamous-cell (malignant) epithelioma—hard and deep seated.

Lichen Planus.—From a practical point of view the Roentgen ray is of service only in the hypertrophic type of the disease, when there are a few isolated, resistant patches. Here it is extremely efficacious. A few days after a single suberythema dose the itching ceases and in two or three weeks the lesions disappear.

Psoriasis.—Ordinarily, psoriasis is easily controlled by the proper use of dermatologic remedies, so that the use of the Roentgen ray is limited to resistant lesions or to the so-called inveterate patches of the disease. The psoriatic skin is hypersensitive to Roentgen radiation, possibly on account of the previous use of chrysarobin or other irritating chemicals. For this reason, and also because, as a rule, very little ray is required, it is preferable to employ the divided-dose technic. In stubborn cases the Roentgen ray will be found of real value.

Eczema.—In eczema the Roentgen ray is of service only in the subacute, chronic and rebellious types of the disease, especially where there are a few isolated, thickened, pruritic patches that have resisted ordinary measures. There is, however, one exception, namely, the acute or subacute vesiculosquamous eczema occurring in patches on the dorsal surfaces of the hands and fingers. Here the Roentgen ray is exceedingly efficacious, and is specifically indicated, because this clinical type of the disease is notoriously rebellious to all other therapeutic measures.

The obstinate keratotic eczema of the palms and the soles will usually yield rather promptly to the Roentgen ray after they have refused to respond to other forms of treatment. In most types of eczema, as in psoriasis, the Roentgen ray is not indicated until regular dermatologic remedies have been tried, for, as a rule, the simpler measures will suffice. Again, as in psoriasis, and for the same reasons, the divided-dose technic should be employed.

Fig. 40.—Case in Fig. 38 after two filtered, intensive doses of H 16; no relapse for one year.

Lichenification and Lichen Circumscriptus.—In these affections, a single small dose of the Roentgen ray will usually suffice to overcome the itching at once and cause the eruption to disappear in a few weeks, especially if the treatment is reinforced by ordinary dermatologic remedies.

The divided technic gives equally good results.

Pompholyx (Dyshydrosis).—Fractional doses of the Roentgen ray are a help in combating this affection, which not infrequently is stubborn.

Fig. 39.—Photomicrograph of small piece of tissue removed from lesion shown in Figure 38.

HYPERTROPHIES

Clavus, Callositas and Verrucae.—Corns will usually respond to one or two intensive doses. It is necessary, however, in order to avoid recurrences, to ascertain and overcome the cause, such as pressure from tight or improper shoes. Some of my most brilliant therapeutic results have been obtained in the Roentgen-ray treatment of callositas, or painful plantar

warts; certainly the patients are very grateful for the relief. I know of no other treatment that can compare with the Roentgen ray in efficiency. The thickened horny layer should be removed with a razor and then an intensive dose of the Roentgen ray administered. The first treatment may consist of H 4, B 9. In some instances this one application will suffice. More often, however, a second treatment will be necessary, and this should not be given in less than four weeks from the first application, and the dose may be increased, unless contraindicated, to H 6, B 9. I have never been compelled to give more than three treatments to produce a complete cure, and as yet I have not had a single recurrence. My results with the intensive treatment have been far superior to those obtained before I developed the intensive technic. The common wart (verruca vulgaris) will usually disappear as a result of a single intensive treatment. Not infrequently the treatment of one wart will cause the disappearance of similar lesions in the same neighborhood. Various types of hyperkeratosis may be influenced by the Roentgen ray, such, for example, as senile keratosis, keratosis palmaris et plantaris, ichthyosis, keratodermia, etc.

Fig. 45. — Epithelioma of lip without glandular involvement. The lesion consisted mostly of a keratosis, but there was some clinical infiltration. This should probably be considered a preepithelioma-tous lesion, or a very early epithelioma.

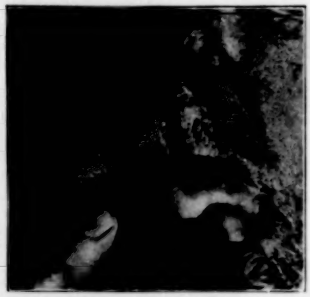

Fig. 46. — Same as Figure 45. The thickened horny layer was first removed, and then two intensive doses of H 8 each were administered. There has been no return over a period of two years. There was a little leukoplakia, which also disappeared.

New Growths

Keloid. — Excellent therapeutic and cosmetic results can be obtained in hypertrophic scars, traumatic and "spontaneous" keloids and acne keloid (dermatitis papillaris capillitii). The Roentgen ray is indicated in these affections not only because of its efficacy, but because there is no other reliable treatment. In very large keloids it is preferable to ablate and then apply the Roentgen ray as a prophylactic. This may be done, also, in small keloids, in order to obtain a perfect cosmetic result. I have never observed a recurrence after Roentgen-ray treatment. Unfortunately, keloid requires large quantities of Roentgen ray, and for this reason the intensive method is to be preferred. A well-developed keloid will necessitate from two to six intensive treatments. It is not safe to apply more than six or eight intensive doses at intervals of from four to six weeks, because of the danger of permanent injury to the skin. In very obstinate cases it is preferable to intervene surgically and employ Roentgen ray as a prophylactic, or to give the intensive doses in courses, each course consisting of three treatments at intervals of four to six weeks, with an interval of one year between courses.

Nevus Vasculosus.—The Roentgen ray is capable of producing good results in vascular nevi. The treatment is apparently more efficacious in deep-seated nevi (cavernous angioma) than in the superficial "portwine" marks. In the past, judging from the literature, radium has produced better results in this affection than has the Roentgen ray, but perhaps the future will see the two agents favorably compared in this respect. More experimental work is required, especially in regard to the quality of ray to be used. The few cases that I have treated have required several intensive doses of a "hard" ray before much effect was observed. It is possible that a "soft" or even an "oversoft" ray will prove more effective.

Rhinoscleroma.—The Roentgen ray is almost a specific in this rare, disfiguring and uncomfortable disease. It should be employed intensively, and on account of the fibrosis a well-filtered, "hard" ray is indicated.

Tuberculosis Cutis.—In the literature one finds reports of cures obtained with the Roentgen ray in tuberculous ulcers of the skin and mucous membranes, but I have found such lesions exceedingly stubborn unless of a benign type, such as lupus vulgaris or tuberculosis verrucosa cutis. The hypertrophic and ulcerative types of lupus vulgaris, even when involving the mucosa, usually yield to from one to three intensive doses. The atrophic type of disease, with deeply embedded (apple-jelly) nodules, resists the treatment; at least this has been the case in my hands. In the treatment of lupus vulgaris I have found the intensive technic superior to the divided dose method.

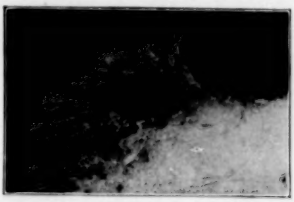

Fig. 47.—Melanoma.

Fig. 48.—Same as Figure 47. Patient received three unfiltered, intensive treatments totaling H 14. A few months later there was a relapse. Two filtered treatments totaling H 24 were then given. No relapse since November, 1914.

Relapses may occur, but not as a rule. Personally I have not had a single recurrence where the patient remained under treatment until the lesion completely disappeared.

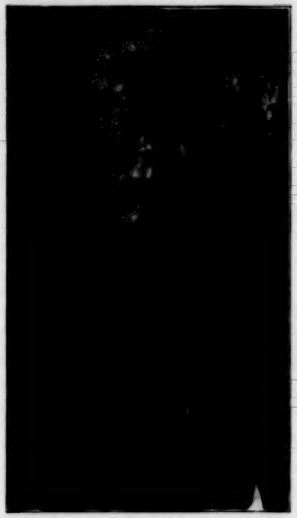

Fig. 53.—Mycosis fungoides.

Fig. 54.—Same as Figure 53 after one mildly intensive treatment. The patient was first "immunized" by fractional doses applied to lesions on other parts of the body.

Tuberculous adenitis, with or without scrofuloderma, yields good results with the intensive treatment. Here my best results have been obtained by the use of a "hard" ray filtered through 3 mm. of aluminium, the dose ranging from 4 to 8 H; several treatments are necessary as a rule.

Tuberculosis verrucosa cutis, if the warty excrescence is first removed by the curet, will yield to a single intensive application. Otherwise several treatments may be necessary. The cure seems to be permanent.

Lupus Erythematosus.—Although records of cures of lupus erythematosus by means of Roentgen radiation are found in the literature, I have failed to cure a single instance of the disease by this method and therefore I prefer other measures, such as the solid carbon dioxid. It seems unwise, in lupus erythematosus and atrophic lupus vulgaris, to apply enough ray to permanently injure the skin, because these diseases seem to invite the development of malignant epithelioma and excessive Roentgen-ray dosage simply adds fuel to the fire.

Epithelioma.—The ulcerative type of basal-cell epithelioma (rodent ulcer) can be completely cured with one erythema dose. The nodular type may require two or three treatments unless the lesion is first curetted. Recurrences are uncommon, there is no pain, no scarring and no interference with business, so that it would seem that the Roentgen ray might be considered the method of election in the treatment of this affection. There are cases, however, that will not yield to the Roentgen ray, but, fortunately, such instances are extremely uncommon. The most rebellious examples that I have encountered are those in which the lesion had been treated by obsolete Roentgen-ray methods. A few years ago it was not uncommon to hear of an epithelioma receiving as many as 150 Roentgen-ray treatments—small, oft-repeated, stimulating doses. These lesions improved to a certain extent and then became very recalcitrant to all forms of treatment; or if they healed under the influence of the Roentgen ray they were very likely to recur. The explanation is possibly that so many stimulating doses taught the tissues to resist the beneficial action of the Roentgen ray; again, it is possible that so much ray produced an analogous effect to that seen on the hands of the pioneers in Roentgen-ray work. It would, therefore, seem advisable to employ intensive treatment and to obtain the maximum benefit with the minimum amount of ray.

I have had occasion to treat a number of benign epitheliomas that had been previously rayed by obsolete methods, and while most of them have responded to the intensive technic, some have remained unaffected and many of them have recurred within a year or

Fig. 61.—Chelitis glandularis of long standing, with a few herpetic vesicles on chin and right commissure.

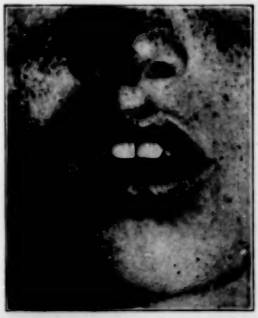

Fig. 62.—Same as Figure 61 after one intensive application (H 4, B 9).

two. In general it may be said that the longer the lapse of time subsequent to former Roentgen-ray treatment, the greater is the chance of recovery under the intensive technic.

In squamous-cell (malignant) epithelioma of the skin the Roentgen ray is uncertain, although very brilliant results are occasionally obtained. Personally I prefer to elicit surgical aid in these instances and

Fig. 63.—Ichthyotic skin.

employ the ray intensively as a prophylactic, unless, indeed, the case is inoperable. The fact that the Roentgen ray will occasionally cure malignant epithelioma warrants its use in inoperable cases, and as a prophylactic in postoperative cases. In such instances it is wise, also, intensively to treat the neighboring lymphatics, even when these are not palpable.

Fig. 64.—Same as Figure 63 after one intensive treatment.

The same remarks may be repeated in discussing epithelioma of the lips, tongue and other mucous surfaces. I have cured (temporarily at least) a number of epitheliomas of the lip, but they have been superficial and the glands were not involved. At the present moment it would seem advisable to refer lip cases to the surgeon and rely on the Roentgen ray as a prophylactic, unless the disease is detected in the earliest stages or unless the case is for any reason inoperable. In regard to epithelioma of the tongue, buccal mucosa and glans penis, I refer all such cases to the surgeon as soon as the diagnosis is established.

Paget's disease, especially if diagnosed early, will yield to a single erythema dose. The preepitheliomatous lesions (keratoses) occurring in xeroderma pigmentosum can be removed by intensive Roentgen-ray radiation. This is interesting, as such lesions are supposed to be caused by the action of direct or indirect sunlight on a peculiarly susceptible skin. In this connection, too, the keratoses produced by the Roentgen ray can be cured by this same agent, especially if employed intensively, and especially, also, if the parts have not been exposed to the Roentgen ray for several years. Senile keratoses (senile verruca, seborrheic warts), which are forerunners of epithelioma, readily respond to a single erythema or even a suberythema application of the Roentgen ray. If there is much thickening of the horny layer, it is advisable to use the curet in order to insure recovery with one application of the ray.

RADIANT ENERGY IN THE TREATMENT OF DISEASES OF THE SKIN*

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In the discussion of this subject, I am presuming that with the present-day knowledge of radiant energy and the physical laws which govern it, whether this energy emanates from the sun or an electrical source, no progressive medical man can longer deny that radiotherapy has come to stay. Even the shrewd merchant in the commercial field has perceived its popularity and has named his goods, "Radium Diamonds," "Violet-Ray Lotions," "X-Ray Corn Solvents," etc.

Radiotherapy is no longer an experiment, and the proved field is becoming more and more widened until all departments of medicine have had to give it consideration.

Surgical diagnosis without the aid of the Roentgen ray is an antiquated art. Medical diagnosis and treatment with some form of this energy has become a matter of daily routine, though perhaps to the dermatologist these agents lend their greatest therapeutic aid.

The forms and sources of radiant energies which are being used by dermatologists are so numerous that I shall be able, within one paper, to mention but few. Of these perhaps the most commonly used are the Finsen light, violet ray, high-tension current effluvia (commonly though incorrectly called the violet ray), radium, and the Roentgen or x-ray.

I have not had personal experience with the application of the Finsen ray or with a strong potency of radium; therefore I shall leave the discussion of these two agents to others who have had sufficient experience and await their tabulated results. So far, however, as I have been able to observe recorded cases, I am convinced that the physiologic and histologic effects of both of these agents are not unlike those of the Roentgen ray, except that each differs from the other in potency and in the periods of time required to produce like changes in cellular life. In fact, the effects of the Finsen ray, violet ray, high-tension effluvia,

* Read before the Section on Dermatology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

radium, and Roentgen ray, when applied to the skin for different periods of time, give reactions which are so nearly alike that it has seemed convenient to divide these effects into the same divisions which have previously been applied to the effects of the Roentgen ray alone:

1. When one of these agents is applied directly or in near contact to the skin for a period, we note, when the reaction becomes visible, quoting from Tousey, "a stimulation of the sympathetic nerves, a pouring out of the blood plasma, increased oxidation, and metabolism."

2. When a greater degree or longer period of application has been given, we note an increase of each of the first-named changes, with the additional increase of hyperemia, elevation of temperature, and a beginning of cell degeneration with a slight exfoliation of the superficial layers of the skin.

3. If the application is continued longer or in a still more intense degree, we note an exaggeration of all the second-degree symptoms, with the beginning of an inflammation in the delicate lining membranes of both the blood and lymph channels, producing an obliterating endarteritis and lymph block throughout the area receiving the direct rays. This may be of such degree as to cause a complete death and slough of the tissue. These degrees of reaction more correctly describe those which are produced by radium, violet ray, and Roentgen ray.

The reactions, following the application of high-frequency effluvia (that is, the violet-colored light with its shower of sparks produced by the passing of a high-tension current through a glass vacuum electrode), of fulguration (the hot spark of the same current when allowed to leap from a pointed electrode), and of diathermy (the intense heat of the tissues which is produced by the double or bipolar high-tension current placed in contact with the surface of the lesion on opposite sides) are similar to the agents named above, though they produce their reactions *immediately* following their application.

It is a demonstrable fact that cellular life is stimulated and metabolism increased within the first degrees of reaction, while within the second and beginning third degrees cell life undergoes degenerative changes, the pathologic cells degenerating at an earlier period and with more rapidity than the normal cells. To this law we owe the successes accomplished in the treatment of malignant and other pathologic growths; also, may I suggest, in the first degree or its effects is found, no doubt, the secret of many of our failures.

Then, as already implied, I believe that whenever we have more carefully studied the histopathology of diseases to be treated, and acquired a more accurate technic of application, we shall more nearly agree as to the value of these energies and have our efforts more commonly crowned with success in the treatment of a certain class of superficial malignancies and diseases of the skin.

I have often longed for the time when skin diseases might possibly be classified with reference to their etiology, histopathology, etc., so that we might study these methods of treatment more systematically and be able to present them to medical students in a more intelligent manner. I have in recent months undertaken such a classification, and though as yet it is tentative, it coincides with my experience in the application of electrotherapeutic methods. These conclusions are based on an experience of nearly thirteen years with the use of one or more forms of these energies, the last seven years being devoted exclusively to dermatology and electrotherapy.

Under the first division or class of skin diseases, I have placed those which have not been favorably influenced by the application of radiotherapy, except in the region of its local application. These diseases constitute a class whose etiology is yet unknown, though they are supposed to have their origin in some toxic product which has been absorbed or has failed to be eliminated by the internal organs, whose function it is to act on them, such as dermatitis herpetiformis, the different varieties of erythemas, the lichens, psoriasis, etc. By way of parenthesis permit me to say that since hearing Dr. Rosenow's report on his discoveries in erythema nodosum, I have been making radiograms of the teeth of a number of these patients and have collected strong evidence tending toward a conclusion of focal infections as a possible etiology in many of this class of diseases; but I am not yet in a position to report on these cases.

Under a second division, I have named a class of diseases which appear to be an inexplicable derangement or condition of the superficial glands, nerves, or of metabolism within the cells, no doubt internal or central in origin, which are favorably influenced by some form of radiotherapy, though with few exceptions they are best relieved by medicinal means combined with some form of radiant energy. Among there are such as: hyperhidrosis, pompholyx, pruritus, prurigo, herpes zoster, most forms of eczema, etc.

In a third class I place most of those diseases which are superficial in origin and are due to local infection of a micro-organism of some variety, such as acne vulgaris, staphylococcic and streptococcic infections, erysipelas, and practically all the mycoid and fungoid infections of the skin, including the tineas, blastomycosis, sporotrichosis, etc. A large percentage of this class will yield nicely to one or more forms of the radiant energies without the use of medicinal applications, though in most of these cases I would prefer to use a combination of medicinal treatment and radiotherapy.

In a fourth class I shall place practically all lesions or diseases which are characterized by an increased development of pathologic cells, whether of a benign or a malignant nature, such as fibroma molluscum, rhinophyma, keloids, superficially located epitheliomas, etc.

I believe that most of the above-named classes of lesions are amenable to some form of radiotherapy alone, if this is applied with intelligent and cautious technic in the earliest stages of the development of the lesion.

Briefly reviewing, then, and speaking more specifically with reference to a few of the above-named classifications, I believe that an attempt to treat a class of skin diseases which are evidently systemic in origin, whether of a toxic or infectious nature, by radiotherapy locally applied, may give some temporary relief, though it is like an attempt to destroy the life of a serpent by beginning at its tail. These agents, therefore, can be recommended only as one of the aids of dermatologic therapy. I have found the Roentgen ray in the treatment of hyperhidrosis, dyshidrosis and several forms of eczema an almost indispensable aid if pushed to a point of first reaction in the first series

of treatments, though without other or medicinal treatments these eruptions are prone to recur. The Roentgen ray has given me valuable aid in the treatment of all forms of pruritus and in one case of true prurigo I have been entirely successful.

Perhaps the most remarkable effect observed on any disease under the second classification is the almost certain relief from the lancinating and burning pains, so characteristic in herpes zoster, which occurs when the high-frequency effluvia is vigorously applied over the trunk and superficial nerve supply of the parts affected. This relief sometimes comes immediately following only one application.

In view of the clinical reports of the treatment of tineas with the Roentgen ray by Sabouraud several years past, it is unnecessary to comment on my own verifications of it, since most of you have doubtless experienced the same gratifying results.

Notwithstanding the fact that the treatment of acne vulgaris and acne rosacea by Roentgen ray has been disparaged by many dermatologists as dangerous, and giving unsatisfactory sequelae, etc., I have continued to use this most valuable aid as a routine for ten years in the treatment of these diseases and in not a single case as yet have I had cause for regrets.

Erysipelas has long been known as a local and superficial infection with systemic products. With this in mind I began, in 1910, to treat the early manifestations of this disease by a single series of Roentgen-ray exposures and after treating a number of cases, beginning at an early stage of the disease, I am fully convinced that it is a most valuable aid. Indeed, in some of these cases, I noted after either a single or a second exposure an immediate flushing of temperature, which, however, subsided within from two to six hours, with an abating of all symptoms and an uneventful recovery.

Of the fourth classification, perhaps the most uncertain results I have obtained have been in the treatment of the different varieties of sarcomas by radiotherapy. This class of malignant growths has not proved a very favorable one to treat by radiotherapy alone. No doubt this is due to their channels of absorption, the blood vessels, which are not rapidly and quickly blocked without an unusually strong treatment. With this exception, I have found the treating of this class of lesions by fulguration, diathermy, or Roentgen ray one of the most successful and satisfactory phases of all my work, and furnishing an unbounded field for dermatologic practice.

The treatment of superficial epitheliomas before the stage of well-developed metastasis has been a large part of my practice and I cannot refrain from reporting a few of the totals and percentages briefly gleaned from my records of the past few years.

For these cases and for most valuable assistance rendered in the treatment of them I am much indebted to my many professional friends of Oklahoma and other states, and to my associate in practice for the past six years, Dr. M. M. Roland. The length of this paper will not permit more than a statement of totals, without comment. A number of years have elapsed since treating my first case of epithelioma with the Roentgen ray, and it is therefore impossible at this time to trace the after-history of all of my early cases. Therefore, taking our records consecutively for the last seven years, we have been able to trace 177 cases of epitheliomas of different varieties and located superficially on various parts of the body. In a large number of these cases the diagnosis was verified both microscopically and clinically. From this number we have to deduct fifteen cases in which the patients have later died of the same disease or have had a recurrence, and we count them as Roentgen-ray failures. This leaves 162, or 91 per cent., in which the patients are now living with no evidences of return.

We have learned that epitheliomas located on the hands and on the alae of the nose, just at its fold on the cheek, perhaps owing to a greater mobility and irritation, are of an uncommonly stubborn nature, and five of our failures have been in such cases. If therefore, we had subtracted the cases at these particular locations, we should have 94 per cent. living instead of 91 per cent. of those treated by Roentgen ray alone on selected locations.

And now, you may say, what of the much-discussed location of epitheliomas on the lips? We have traced twenty-seven consecutive patients who were treated by the Roentgen ray alone during the past seven years. Of this number, twenty-two, or 81 per cent., are still living without recurrence. Some of these were treated five and some seven years ago, and we have no doubts that a majority of these are entirely well.

It may be said that no such record can be made except in select cases. This I admit, although in a number of these cases the lesions were well-developed indurated growths as large as a hazelnut or larger, and one of these cases had perceptible evidence of metastasis in the submaxillary region. Most of them, however, were those, as above mentioned, in which treatment was begun before evidence of metastasis, and had not more than one third of their surface covered by the mucous membrane.

In conclusion, then, I shall say that my experience with the use of radiotherapeutic agents in skin diseases has taught me:

1. It is necessary to look carefully into the pathology and etiology of a disease before attempting to treat by one of these methods.

2. These agents are valuable aids in the treating of a certain class of skin diseases when combined with medicinal and other methods.

3. There is a class of skin diseases, chiefly local in origin, which can be treated by radiotherapy more successfully than by any other method.

4. While the treatment of malignant lesions with these energies is much abused by the unskilled, yet we are coming to recognize that radium and the Roentgen ray, when properly administered in a selected class of cases, have proved themselves superior to all other methods which have been used to the present time.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MAC KEE AND LAIN

DR. RICHARD L. SUTTON, Kansas City, Mo.: The results attained by these two speakers have done much to convince me of the value of the massive dosage method. In order to avoid disastrous results, however, great care and a considerable degree of skill are necessary. I well recall a recent instance in the practice of a colleague in which this method was employed in the treatment of a case of ringworm of the scalp. A severe burn resulted, and extensive skin grafting was required to correct the ensuing deformity. With regard to the prognosis in cancer of the skin, I have found carcinomas involving the mucous membranes, the lower lip, the cartilage of the ear, the parotid region, and the backs of the hands to be the most dangerous.

DR. ERNEST DWIGHT CHIPMAN, San Francisco: I remember reading the discussion of Roentgen-ray treatment at a meeting in New York in which some one expressed the view that in New York the Roentgen ray was no longer seriously regarded as a therapeutic agent in dermatology. It seemed to imply that we poor souls in the provinces who still use it are hopelessly behind the times. I am glad Dr. MacKee's paper does not confirm this notion. Dr. MacKee expresses dissatisfaction with small doses and we all must have corroborated that idea in our own experiences. I have noted not only in epitheliomas but also, and particularly, in psoriasis, that while one gets a temporary recovery, recurrence takes place, and the recurrence is more difficult to get rid of than the original trouble. I may have misunderstood Dr. Lain in his reference to erysipelas; I gathered from his paper that the Roentgen ray was a parasiticide, which I have never believed and which I would be glad to hear him explain.

DR. DOUGLASS W. MONTGOMERY, San Francisco: In epithelioma I like to curet out the neoplasm to get down to the base; and I do that because I believe the Roentgen rays do not act very deeply. Furthermore, there is no object in sparing the diseased tissue. After scraping away the diseased tissue I burn the base with a good penetrating caustic. This serves two purposes; it eliminates any cancerous tissue that may still remain, and it seals the wound against infection. This gives a cleared base on which the Roentgen rays can best act effectively. Dr. MacKee mentioned that in the previous discussion.

Dr. MacKee mentioned a most interesting and difficult matter when he spoke of warts under the nails. We have had now for a long time a girl under our charge with sweating palms and with most persistently recurring warts of the volar surfaces of the fingers. The sweating persisted and the warts recurred even after the employment of Roentgen rays. Some assert that flat warts, verrucae planae, may be removed by Roentgen rays, but I do not see why Roentgen rays should be used on flat warts, and I think it is better to treat them with the curet and strong acetic acid.

DR. H. H. HAZEN, Washington, D. C.: During the past winter I have been doing Roentgen-ray work as done by Dr. MacKee, and I want to say it has been the biggest gain in therapy that I know. There is no more comparison between the old and the new methods of using the Roentgen ray than between any other widely separated things.

It seems to me it might be theoretically dangerous to curet a cancer before using the Roentgen ray. I think the best thing to do when you want to get rid of the surface is to use the electric cautery. That opens up no channels.

I was interested in Dr. Lain's statement that he cured 90 or 91 per cent. in a group of epithelioma. Were those cases followed up by Dr. Lain for a period of five years? We had no statistics over this five-year period in Roentgen-ray work; but I hope that Dr. MacKee and Dr. Lain and others using the Roentgen ray will publish their results. We need in the worst way those results, in order to compare them with results obtained by surgical procedures.

DR. HARRY E. ALDERSON, San Francisco: The reason we hear of different results from the use of Roentgen rays in the hands of different men is that there is no common standard of measurement of the dosage in use. I think very often great chances are taken by individuals in attempting to apply the Roentgen ray without using any of the known means of measuring the doses. Should burns result from such unmeasured doses there is no doubt in my mind that legal action could be successfully conducted against the operator. The fact that half-way measures in the treatment of epitheliomas are extremely dangerous cannot be too strongly emphasized. Either the knife should be used thoroughly or the ray intensively, or both should be used. We prefer the knife and afterward the ray. Most of the cases of extensive epitheliomas that we see are in patients who have had the early lesions treated with the various "half-way measures" advocated from time to time.

DR. GEORGE M. MACKEE, New York: I prefer to curet the nodular type of basal cell epithelioma. If this is done a cure can usually be effected as a result of a single erythematous dose of the Roentgen ray. I do not curet the squamous cell type of epithelioma.

Regarding the parasitic or germicidal action of the Roentgen ray, it is the general consensus of opinion that it has none. We know, for instance, that a very small amount of Roentgen ray will sometimes cure sycosis vulgaris, but this prompt action is probably due to a modification of the soil rather than to direct action on the bacteria.

DR. EVERETT S. LAIN, Oklahoma City: Dr. MacKee answered Dr. Chipman's question, only I wish to add that by blood count following the Roentgen-ray treatment, that is, a count within from thirty minutes to two hours, you will note in most treatments, quite remarkable changes in the count of the red and white corpuscles. You usually have an increase in the leukocytes. There is no doubt to one who has made the test, that indirectly the Roentgen ray does serve as a parasiticide. Dr. Hazen asked how long we followed these cases. I said in my paper that they covered seven years. I might have included in that nearly 200 cases that antedated that period. These cases I did not have time to trace after I decided to write this paper. About 20 per cent. of the reported cases have been treated in the past two years. About 60 per cent. prior to that time. According to former statements of surgeons, that is a good test of a cure. We believe these patients are well. However, we can allow a reduction of the percentages and yet have a fair percentage of recovery.

DR. H. H. HAZEN: What percentage of five-year cures have you had?

DR. EVERETT S. LAIN: I cannot give the figures without looking up my records, but making a guess, I should say not less than 35 per cent., excepting those on the hands, which as I said have been uncertain.

MODERN TREATMENT OF FRACTURES OF THE LONG BONES FROM THE ORTHOPEDIC POINT OF VIEW

WITH CLINICAL OBSERVATIONS AND CONCLUSIONS*

J. W. COKENOWER, M.D.
DES MOINES, IOWA

The treatment of fractures of the long bones has been given much attention during the past few years, by the general and orthopedic surgeon, relative to the closed and open methods and the use of nails, wire, plates and bone grafts. No matter how scientific and modern the work, and how successful the results obtained, it is absolutely necessary that the bones be immobilized and held in position by some kind of mechanical appliance whether the treatment be open or closed, or both. As orthopedic surgeons give more attention to the latter than surgeons do, it would be but natural to conclude they were as able, if not more so, to do such work with better clinical functional results.

The direct fixation of compound fractures, when the bones are exposed and cannot be held in position by splints, has come into general use by surgeons of large experience, but when the matter of simple fractures is presented for consideration, there is a lack of uniform opinion, whether the fixation shall be by open or closed method.

The difficulty of the open method in many cases, the unsatisfactory adjustment of fractured bones by manipulation and the uncertainty of fixing and maintaining the broken ends in perfect alignment, prompts one to decide in favor of the open method, augmented by such orthopedic mechanical devices as will positively hold in perfect position the fractured bones.

* Read before the Section on Orthopedic Surgery at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

That this is the best treatment no one will doubt, when done by a good surgeon with operative and mechanical skill backed up by perfect asepsis, and any lack of the latter is more fatal to perfect union than a similar error in technic in abdominal surgery; for in this the lymphatics are less able to cope with ordinary infections, than in the peritoneal cavity, and in no other domain in surgery are aseptic errors so often punished by failure.

It is necessary to divide our simple fracture cases into two groups: those that can be treated in a hospital and those that can not. The greater number of cases have always been treated by the general practitioner, and his functional results are usually good and satisfactory to the patient, even though a roentgenogram may show an imperfect alignment and defective judgment, hence, the general or orthopedic surgeon can never hope to control the exclusive management of fractures and the open treatment can never become universal.

It would not be advisable to do an open operation in all simple fractures because many of them can be perfectly adjusted by manipulation, under anesthesia, and accurately held in position by proper retentive dressings. A Colles' fracture of the wrist can nearly always be reduced if the fragments, which are often impacted, are unlocked by increasing the deformity before attempting reduction. A Pott's fracture of the ankle joint will often be set with a snap if traction is made in the line of the deformity, and many transverse fractures of the femur show little tendency to displacement when proper mechanical appliances are used.

Therefore the most enterprising surgeon would hardly be justified in stating that all simple fractures should be treated by the open method, even in the face of Sir Arbuthnot Lane's statements that they should, and he uses in all his open operations the same external retentive and fixation appliances to reinforce the strength of his plates, screws and clips, that are used in the nonopen treatment.

The fixation appliances used in the open method can be depended on only for a few days, because of the pathologic softening of bony structure surrounding the peg, screw or wire, and the bones become loose unless augmented by a carefully applied external splint. This fact of softening has been found in cases in which the open method has been resorted to in from ten days to six weeks after the fracture and the ends of the bones were too soft to hold the pegs or screws. This softening, on investigation by the Roentgen ray, at different times proved to be a pathologic one, which accounts for the many cases of nonunion of bones that had been accurately adjusted and properly retained.

Hence, if it should be found that reduction cannot be accomplished in the usual way, or that coaptation cannot be maintained, the open or operative method should at once be resorted to before the bones have undergone reparative softening.

The fact that screws and wires do not maintain and hold until bony union is complete has been shown in all cases in which it became necessary, early or late, to remove them, either from infection or because of detachment because of softening bony structure.

I have used the bone-graft treatment of Drs. Murphy and Albee and obtained good results in all cases of nonunion wherein such treatment has been used, especially when the inlay of grafts is cut and inlaid in such a manner that each stratum of periosteum and bone of the fracture meet and approximate a like stratum of the graft introduced. This can usually be done, after which not only will union occur, but the individual cells of both graft and bone will be stimulated, and overgrowth and callus formed with strength equal to, or exceeding that normal to the part.

It has been found that when an open operation was attempted in from two to four weeks after injury, in cases of oblique and in some cases of transverse fracture of the femur, leg, arm and forearm, with tendency to overlapping, that it was difficult and sometimes impossible to overcome the muscular contraction. When this occurs an open operation should be done, as soon as the patient can be brought into favorable environment, because this is the class of cases that give most trouble and this condition is the cause of nonunion.

It has been my custom to give an anesthetic in all cases in which manipulation is too painful or muscular rigidity is marked and endeavor to secure crepitus, if possible, that I may be more certain that no muscle, fascia, or loose fragment of bone is interposed between the fractured ends of the bone. While it may be true that nonunion is often due to defective innervation, diseases of the bone, syphilis, or excessive rarefaction, we must admit that a defective relation of the fragments is the prime factor to be considered. However, an entirely different condition may produce nonunion because of a lack of proliferation of soft and bony cell tissue.

I have seen several cases in healthy and vigorous young persons in which there existed little or no displacement, and in which immobilization was easy and complete, that ended in nonunion, due, no doubt, to a restricted local reaction and defective hyperemia with insufficient nutritive and reparative local reaction, which easily yielded to vigorous friction of the ends of the bones.

The fear of converting a simple and noninfected fracture into an open and possibly an infected one was so great that, rather than take the chance of creating an infected compound fracture, one was willing to take some chance of obtaining a fairly good functional result, even though the Roentgen ray might show imperfect apposition. Hence, we are no longer able to cover up our mistakes because the Roentgen ray will show them. My experience has been that when the Roentgen ray shows that the bones were in proper apposition in the beginning and union complete in the end of treatment, and that no mistake has been made, no matter how seemingly unsatisfactory the results were before this knowledge was obtained, the psychologic as well as the physiologic functions always improved afterward.

I have used the two extremes in the open and closed methods of treating fractures, but my functional results were not always satisfactory, which prompted me to use the medium and extremes conservatively. Since doing this not only were my functional results more satisfactory, but the general contour, in the normal axis of the limb, was better, which prompted the following conclusions:

1. All fractures that can be adjusted manually and can be fixed in a position that will insure a good functional result, even though the Roentgen ray shows a lack of perfect end-to-end approximation, are to be treated by the closed method.

2. In all fractures with marked deformity, such as overlapping, angulation, lack of contact of fractured surfaces, evidence of soft or detached osseous tissue between the ends of the bones, and especially compound fractures when it is apparent that union will not take place, the open method is invariably used.

3. The open method being used, I prefer the Lane plates, when sufficient smooth bone surface for their attachment can be obtained. When this cannot be done, prepare the ends of the bones for good and satisfactory apposition. If not sufficiently jagged make at least one lateral and one anteroposterior dovetail in the ends of the bones to prevent them from displacement, after which wire, and if proper retentive appliances be used good results should be expected.

4. The bone-graft inlay should always be used in nonunion, especially when the pathologic softening of the ends of the bones exists augmented by infection or misplacement of the ends, including soft tissue between them, but not in simple fresh fracture or fractures, to which the Lane plate will be better adapted.

5. The mechanical immobilizing support must be satisfactory, otherwise previous preparation, no matter how good, will be a failure. No rule can be made for the use of plaster of Paris and splints, except that the former should not be used when any swelling is present and should never be left on too long, because atrophy of the soft tissue may do the immobilization harm; but splints, when properly made and adjusted, are always satisfactory.

6. The Roentgen ray should be employed early whenever possible, to aid in a proper estimation of the extent and location of the fracture, to determine whether the open or closed method should be used, and if the former, it should be done promptly. The Roentgen ray should again be used, when the patient is discharged, for anatomic and functional reasons.

Utica Block.

ABSTRACT OF DISCUSSION

DR. ROLAND HAMMOND, Providence, R. I.: I agree with most of what Dr. Cokenower said. I believe that as orthopedic surgeons we have a great opportunity in the treatment of fractures. The orthopedic mind naturally inclines to the solution of mechanical problems such as are involved in the treatment of a fracture. There are three requisites necessary in the treatment of a fracture: (1) a complete Roentgen-ray study of the fracture before and after reduction; (2) the use of anesthesia in practically every case, and (3) at times a consultation. We can no longer treat a fracture according to textbook methods. Every case is a separate study, according to the conditions as shown by the Roentgen ray. In treating a fracture I always make a roentgenogram so as to show what the condition is. Then under ether I reduce the fracture. Take a plate while the patient is still under ether, and if it shows proper reduction, put the fracture up. If not, I keep on until I have proved that the fracture can be reduced by further manipulation, or that it cannot be reduced and may require an open operation. I think a good many of the fractures of the long bones, especially of the femur, are not properly reduced, because countertraction is overlooked. Traction is employed, but countertraction is not, and in setting a fracture of the leg, especially of the femur or of both bones, if the limb is put on to a frame where traction can be applied with a windlass, with counterpull in the perineum, you can put on the plaster or whatever apparatus you choose to employ, without depending on an assistant to hold the leg. The windlass will hold the part firmly so that the plaster can be properly applied. I disagree with Dr. Cokenower as to the use of Lane plates. I believe in most cases they can be dispensed with, and if any form of fixation is to be used, it is much better to employ the bone graft. I think with proper external fixation most fractures can be held, but the metallic internal splint has already given too much trouble in this country to warrant its further use, except in very exceptional circumstances.

DR. ROLAND MEISENBACH, Buffalo: I wish to bring before the section's notice a point which I have observed in connection with fresh fractures and anesthetics, namely, the fact that with nitrous oxid and oxygen as an anesthetic, one does not get complete relaxation; that is, the muscular tone remains fairly tense. This is of great value in setting a fresh fracture, either with or without incision; namely, the semicontracted muscles tend to hold the fragments in place and act as a lock, as it were; whereas, if an ether anesthetic is given, complete relaxation will often tend to a flail-like condition at the point of fracture. If you can reduce your fracture without complete relaxation, in many places you can approximate it and it will hold. I think this also accounts for the fact that many fractures, especially of the wrists, are successfully reduced without an anesthetic.

DR. J. W. COKENOWER, Des Moines, Iowa: I cannot agree with Dr. Hammond that it is necessary to cut down and use a bone graft in a healthy bone or fresh fracture and one that can be put in apposition. It certainly ought to be held in position by the proper mechanical appliances; so that bone grafts as well as Lane splints are the proper things only in properly selected cases. With the attention that orthopedic surgeons of this country have given to bone surgery, they are absolutely and justly entitled to treat fresh fractures, and in doing so there will be less trouble afterward and much less litigation. I believe that the time will come when a majority of fresh fractures will be referred to orthopedic surgeons, because in the end, results are to be considered and the public is the umpire of our work. I think they will decide in our favor, because we are able to do the work and do it right.

PAINFUL FEET

CAUSES AND TREATMENT *

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In discussing the causes of painful feet, I have selected those forms which numerically are most common. As, in the majority of joint conditions, the advice of the orthopedist is sought after the condition becomes chronic, so, too, in painful conditions of the foot, we are not applied to for advice until the condition has gone on for some time and becomes so painful that locomotion is too difficult to be tolerated.

I wish to call attention to the great frequency of foot infections secondary to focal infections in other parts of the body, as in the teeth, gums, mouth, throat and nose; also after grip, pneumonia, typhoid fever, etc., as I have found these to be the cause of the largest percentage of painful feet in adults and children, in the cases examined at the Hospital for Deformities and Joint Diseases during the past two years.

This idea can best be presented by quoting from the recent article by Dr. Lovett[1] of Boston. In his report of 800 nurses with painful and flat feet in the Massachusetts General Hospital, Dr. Lovett states that "the onset was frequently after grippe, tonsillitis, or acute illness of one sort or another." Now, when

* Read before the Section on Orthopedic Surgery at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Lovett, R. W.: The Superstition of Flat Foot, THE JOURNAL A. M. A., April 10, 1915, p. 1208.

infection of the feet which involves all the soft tissues, muscles, tendons, bursa, ligaments, etc., results the ligaments sustaining the arch become relaxed, and unless some fixation support is used, there will be a stretching of the ligaments and breaking down of the arch of the foot, which may or may not continue to be painful.

A similar process is overlooked in children after tonsillitis, measles, scarlet fever, etc. I hope that in the future, when secondary results are looked for in the heart, physicians will investigate the muscles supporting the foot, and when children complain of later rheumatic pains in the foot and legs, proper preventive measures can be used to avoid the later chronic foot trouble.

Our present efforts must be to seek the primary focus of infection and aim at its eradication, after measures for the fixation of the foot and temporary support of the arch have relieved the symptoms and been productive of partial cure.

To treat this condition properly, a plaster cast supporting the arch and retaining the foot in a fixed position is the most perfect splint.

The strapping after the method of Ochsner[2] is also an efficient means of fixing the foot and sustaining the arch.

The Whitman[3] plate, as a support and fixation, has its value. This is also true of other arch supporters. But the too long continued fixation by metal arch supporters results in atrophy of the interosseous muscles, fat, etc., owing to their nonuse. The hardness of the metal is objectionable, as it develops callus of the skin and periostitis of the bones.

When the inflamed foot is neglected or not properly treated, the inflamed agglutinated surfaces fuse together, and we have the fixed or static foot, in which there is no motion between the small bones. This type of foot is most unsatisfactory to treat. I have obtained the best results by heating them in dry air from 250 to 400 F. by means of a Tyrnauer electric baker, and then manipulating and massaging them. I will cite a few cases showing types of focal infections:

Case 1.—*Infectious arthritis from infection of gums.*—Mr. F. H., a detective, referred by Dr. Austin Holles, New York, applied at the Hospital for Deformities and Joint Diseases complaining of flat and painful feet. For two years previous, he had been treated for his painful feet by various types of foot plates given him at the advice of different physicians. In the past three months, his pain had become so acute that it was impossible for him to get about with the aid of a cane, and he was incapacitated from attending to his work. The appearance of his feet made one suspicious of an infectious arthritis. The Wassermann test for syphilis was negative; the agglutination test for gonorrhea was also negative. An attempt to determine the focus of infection revealed infectious pyorrhea of a number of the roots of the teeth. As this resembled the type of case in which symptoms have been benefited and relieved by sterilization of the gums and cleaning up of the deposits in the roots of the teeth, this method of treatment was pursued in this case.

Although the arch of the foot had decidedly broken down, and the Roentgen ray showed evidence of the infectious process, after two weeks' treatment the patient's symptoms of pain had all disappeared, and for the past four months he has been able to attend to his business, and is free from pain; he has also discarded his arch supporters and his cane.

This is an illustrative case of many which have been relieved of all the painful symptoms after the sterilization of pyorrhea infection. I hope that infections of the teeth will be given consideration in future examinations of painful feet.

Case 2.—*Infectious arthritis of the feet from infection of tonsils.*—Mr. M. S., aged 28, bookkeeper, with no venereal history, does not drink spirituous liquors; smokes one dozen cigarettes daily. About six weeks previously, patient had an attack of acute tonsillitis; about two weeks following, the feet were painful and swollen; a few days later, the swelling subsided but the pain continued and grew worse. Owing to the pain and difficulty in walking, he was referred to the Hospital for Deformities and Joint Diseases by his family physician. Examination revealed the tonsils inflamed and enlarged, and the patient was referred to Dr. Julius Auerbach, the throat specialist of the institution, who coincided in the opinion that the throat was undoubtedly one of the sources of infection. The patient was then referred back to his family physician with our opinion and the advice that the tonsils be removed. This was done at the hospital by Dr. Auerbach, March 4, 1915. For the next two days, there was increased pain and tenderness in the feet which gradually subsided, and for the past three months the patient has remained well and is free from all pain. The microscopic examination of the tonsil shows streptococci.

INFECTIOUS ARTHRITIS OF THE FEET FROM NONGONORRHEAL LEUKORRHEA

There is a special class of infectious feet found in married women between the ages of 20 and 40 that are of great interest. Patients are negative to Wassermann and Noguchi tests and also negative for the agglutination fixation test. There is a vaginal discharge and often laceration of the cervix for lymphatic absorbtion. We fail to find gonococci in repeated smears.

The feet are slightly swollen, tender and painful to walk on. I have been able to cure a number of these cases by antiseptic douches of mercuric chlorid and iodin solutions.

The following case is illustrative:

Case 3.—Mrs. B., aged 32, married at the age of 22, had three children and no miscarriages. She had some vaginal discharge following birth of second child five years ago, continued after birth of last child two and a half years ago; no increased temperature or illness after any of her confinements. For the past two years she has worn arch supporters for painful feet, with little relief of symptoms. When patient was first examined by me, Nov. 18, 1914, her feet were somewhat swollen and very tender when walking. There was a suspicion of neisserian infection from their appearance; several examinations were made of the discharge, but no gonococci found. Her husband denied venereal history; an examination of his urine and prostatic secretion was also negative. Patient received vaginal irrigation with 1:5,000 mercuric chlorid solution three times a day. In five days the symptoms in the feet began to improve and in two weeks had all disappeared. The patient has gone about with ordinary shoes without arch supporters and has remained well ever since.

This is one of a class of cases of nongonorrheal vaginal infection.

OVERTAXATION AND NONUSE OF MUSCLES

In addition to the class of feet that are weakened by infectious process, we have a second class that occurs in policemen, motormen, salesmen, pedlers, etc., who, owing to their standing for long hours, overtax the muscles that support their arches.

A similar condition is often brought about by the sedentary occupation of men and women, and by the

2. Ochsner, E. H.: Potential and Acquired Static Flat Foot, The Journal A. M. A., Nov. 23, 1907, p. 1742.
3. Whitman: Med. Rec., New York, Aug. 13, 1907.

nonuse of the muscles, an atrophy taking place in the anterior and posterior tibial muscles, resulting in a letting down of the arch of the foot, together with pain in the arch of the foot about the external malleolus, the pain often extending to the insertion of the internal lateral ligaments of the knee; we also have pain in the hip joint, occasionally in the small of the back and often between the shoulder blades.

In the latter class of cases, much benefit can be obtained by having the patient go through muscle exercises and the use of the Zander apparatus, which develop the muscles that hold up the arch of the foot, and by having the patient bear the weight of the body on the outer side of the foot; this can be aided by building up the inner border of the shoe from one-eighth to one-fourth inch and attaching a Thomas projecting heel, and the patient walking so that the inner borders of the feet are parallel.

In this class of cases, if arch supports are needed, I use felt pads shaped to conform to the arch of the foot, with sufficient thickening to give proper support and elevation until the muscles are developed to support the arch of the foot properly.

GONORRHEAL INFECTIONS OF THE FEET

In considering the various causes of painful feet, I do not think that a proper amount of consideration has been given to the neisserian infection, when we consider that about 60 per cent. of the male population acquire the infection. The trouble in the feet may occur in the first week of the infection. It may appear years after the original attack from a focus in the prostate and seminal vesicles of the male, or from the tube and ovaries in the female, producing periostitis, bursitis and spurs. I have experienced some unlooked for surprise from making a uniform agglutination fixation test in acutely inflamed feet. Roentgenoscopy reveals the rarefaction of the bones and spurs.

Cases 4 and 5 are striking illustrations:

CASE 4.—Mr. M., the proprietor of a drug store, had feet which were painful on walking and on pressure, tender and swollen. He had been treated by various consultants in the past two years with all forms of antirheumatic treatment, without any benefit. In my judgment, his feet had the appearance of neisserian infection. When I made this suggestion to the doctor, both the doctor and patient became very indignant, as the patient had been married eight years with two healthy children. At first, the patient objected to examination, but later consented. A large inflamed right lobe of the prostate was found, and from the secretion expressed and sent to the laboratory, active virulent gonococci were found. Under appropriate treatment, massaging of the prostate and protargol irrigation, the pain in the feet entirely disappeared and the patient made a perfect recovery and is able to go about in ordinary shoes.

CASE 5.—Man, aged 23, chauffeur, had gonorrhea at the age of 14. Owing to a painful heel at the age of 18, a roentgenogram was taken which showed spurs; he was operated on and the spurs removed; pain was not completely arrested and a second operation was performed, when the pain disappeared for four years, but reappeared. He applied at the Hospital for Deformities and Joint Diseases. History of last atack of pain in the heel dates back to two months, when he began to suffer pain in both heels extending over the malleoli; arches weakened, movements limited, especially dorsal flexion and adduction. He still had a morning drop; urine shows presence of gonococci. Roentgenoscopy reveals a new outgrowth of bone over the area previously operated on; also spurs. Patient is now under treatment by massage of the prostate, irrigation with protargol and autogenous vaccines; later an operation will be performed.

TUBERCULOUS INFECTIONS OF THE FOOT

This is found most often in children, appearing gradually with some swelling and pain, local tenderness on pressure, and the child shows a slight limp. Later the swelling increases and there is a breaking down of the infected area. The Roentgen ray shows rarefaction and breaking down of the small bones; the von Pirquet is generally positive, and an excess of acid-fast bacillus is found in the feces.

I have been successful in curing a number of such cases by the building up of the general health of the patient, and soaking the affected foot in hot water for one hour three times a day; we thus obtain a primary hyperemia from the hot water, and a secondary one when we replace the water pressure of 62½ pounds to the square inch by the atmospheric pressure of 16 pounds, thus keeping up the hyperemia for some hours.

SYPHILITIC CONDITIONS OF THE FOOT

The periostitis and osteitis of the bones of the foot and gumma of the soft parts are found in congenital and later acquired syphilis, in which we have pain and great local tenderness, which, if promptly treated by our syphilitic remedies, does not break down; but on delay, we may have to resort to surgical procedure.

As aids to diagnosis, we have (1) patient's history; (2) finding the *Spirochaeta pallida;* (3) Wassermann test; (4) Noguchi test; (5) the Roentgen ray, showing (*a*) periosteal thickening, and (*b*) a uniform bone shadow of compact and cancellous tissue (first report by the author, 1906), on which a diagnosis should be made without a blood test.

For the treatment of syphilitic bone conditions, an intravenous injection of salvarsan is given and repeated every seventh day, from three to six injections being given, after which inunctions of unguentum hydrargyri, 50 per cent., are applied daily. If evidence of salivation appears, the mercury is discontinued for a time.

CASE 6.—Mr. N. H., aged 36, was referred to me by Dr. Fishberg, examining physician for all medical cases applying at the United Hebrew Charities, City of New York. Patient had complained of pain in both feet and had been advised to wear foot plates. Not having the means to purchase these, he was referred by the doctor to the Hospital for Deformities and Joint Diseases, without his making a personal examination. The following history was obtained, Sept. 22, 1913: Six months previous to onset the patient suffered with headaches, which were so severe at night that he was compelled to discontinue his occupation, which was that of a waiter. Oct. 23, 1913, he had fever and chills during the night; the following morning, he was unable to get up; the left knee was swollen and powerless; he complained of pain when attempting to bend it. He sent for Dr. A, who diagnosed the condition as rheumatism and applied black salve (ichthyol); the patient was under his care for four weeks, but the condition remained unchanged; Dr. A therefore referred the patient to Hospital 1 under care of Dr. B; here he received twenty-one treatments of baking apparatus at the rate of three treatments per week; but as he felt no better, Dr. B referred him to Hospital 2, where he came under the care of Dr. C in the orthopedic department; this doctor diagnosed the condition as loose cartilage and applied a plaster cast for two months, but no relief was obtained. Then the patient sent for his lodge physician, Dr. D, who diagnosed the trouble as synovitis and tried to tap the knee twice in two places, but did not succeed. Next the patient was referred to Dr. E at Hospital 3; but as Dr. E was not there at the time, he came under the care of Dr. F, who immediately removed the cast, believing that this would cause ankylosis. He cauterized the knee

three times a week for several months, tapped it, and had a knee cap made which the patient was still wearing when he applied at this institution. As he still obtained no relief, Dr. D referred him to Hospital 4 under the care of Dr. G; a roentgenogram was taken which, the physician said showed tuberculous spots of the bone, and Nov. 19, 1912, an operation was performed in which a portion of the tibia was removed; the patient remained in the hospital four days, was discharged and instructed to return three days later, which he did; at this time he was examined by a dispensary physician and then advised to return three days later; meanwhile the patient became feverish and chilled and complained of sticking pain; he sent for Dr. D, who said he was too ill to be removed to Hospital 4, and was therefore transferred to Hospital 5, where he remained for eleven weeks; his knee was opened and cleansed thoroughly, then a cast was applied for eight weeks; in January, 1913, he was discharged; then Dr. F, in charge of the orthopedic department at Hospital 5, was sent for, and having recognized him, instructed him to return to the dispensary at Hospital 5; his knee was cauterized, baked and massaged for several months; following this treatment, he was able to bend the knee; the swelling decreased considerably and the pain was somewhat relieved.

In February he complained of severe pain and cramps in the left ankle during the night; the following morning, he noticed swelling present; he went to Dr. F and a roentgenogram was taken which showed some injury to the bone. June 14 the patient was sent to Hospital 5 and an operation was performed in which the bone was scraped. Dr. H diagnosed it as synovitis and applied a cast for four weeks, but the condition remained the same. Finally the patient applied at this institution for treatment, Sept. 22, 1913. He was referred by Dr. Fishberg for foot plates.

Objective evidence of the knee joint: 1½ inches larger than the opposite knee; has a synovitis in which motion produces scarcely any pain and the limitation of the motion is only by the restriction fluid in the joint. Ankle 2 inches larger than the opposite ankle; no pain or tenderness on pressure with limitation of motion.

The swollen appearance of the patient's feet and ankles led me to suspect syphilis. The roentgenongram of his foot showed syphilitic periostitis. The Wassermann determination was 4+ positive. The point of interest in this case is that after passing through five different institutions and medical examinations by eight physicians, in no case had the Roentgen ray excited suspicion as to the patient's trouble being syphilitic, and in no institution was a Wassermann or Noguchi test made. The patient, under salvarsan, mercury and iodid, made a perfect recovery, wearing a Frauenthal knee splint for a short time, owing to the relaxed condition of his knee joint. The swelling and discomfort in his feet were completely relieved after two weeks of antisyphilitic treatment. He has remained well for the past two years.

GOUT

The causes of gout have not yet been positively ascertained, for there is still a doubt as to whether it is due to the defective elimination of the urates themselves, or, on the other hand, whether it is a disturbance of the purin bodies, which will later result in the formation of combinations of urates. The clinical entity called gout is brought about by the sodium biurate and other imperfect combinations of uric acid deposited in the tissues.

There is no doubt that all the large joints are affected with gout, but the most frequent affection is in the big toe. Pain, swelling, redness of the toe and an inclination to keep the foot elevated are the characteristic symptoms.

The internal administration of colchicum does not change the quantity of urea eliminated, and there is a decrease in the excretion of uric acid.

This in no way explains the relief of pain and the subsidence of symptoms when colchicum is administered; neither can I add any light on the rapid relief of the symptoms, when we carry in our mind the joint pathology.

For a period of twenty years I have given to patients in an acute attack of gout, involving the smaller joints or the knee, treatment which consists of applying sponge electrode saturated with the fluidextract colchicum attached to a galvanic current, reversing the current every two minutes, using the current of a strength up to the patient's point of tolerance of pain. Three treatments in thirty-six hours relieved all the acute symptoms of pain, swelling, etc.

Case 7.—Mr. F. V. W., manager of a hotel, whom I first saw in consultation, April 16, 1909, was confined to bed after an acute attack of gout involving the right big toe. In all previous attacks he had been in bed from two to three weeks, and reconciled himself to remain that time. When I saw him I informed him that if he would come down on crutches to my office in a cab, I would give him relief in less than three days. He regarded this prognosis as ridiculous, but said that sooner than remain in bed and suffer the agonies of the disease, he would take a chance. After the second treatment, he was able to put his foot on the ground, and on the third day, discarded his crutches and walked about, since which time (1909) he has been treated for seven attacks by the same method.

OBLITERATING ENDARTERITIS

This is a common disease among Russians, Poles and Galicians, characterized by the following symptoms:

The subjective symptoms differ only in the intensity. The patient complains of intense pain in the toes and feet extending up the leg, increasing at night.

The objective symptoms are:

1. The patient walks with a distressed gait, resembling painful flatfoot, for which he is often treated.
2. The feet appear blue, congested and cyanotic, but the pressure of the hand and manipulation of the foot elicit little pain.
3. The sensitiveness to heat and cold is diminished.
4. The skin has the clammy feeling of death. Nothing that I have felt has this cold uncanny feeling, except a cadaver.
5. The pulsation of the plantar arteries is either unrecognized or decidedly enfeebled.

The pain is so intense at night as to cause the patient to lose his sleep. In severe cases the patient remains in a chair to sleep for a short period, and then has to walk about. The pressure of the shoes adds to the pain, so some form of felt shoe, or similar material, is adopted, or in some cases a flannel cloth is wrapped around the foot and a large rubber or slipper is worn.

The pain is not so great in warm weather, but the symptoms, although growing more severe, gradually extend over many months and in some cases over years of time.

In some cases there is a type of atrophy of the toe, a darkening of the skin with a dry gangrene appearance, in which the progress of destruction differs materially in its rate of progress to that found in other forms of gangrene; in some cases the destruction of the toe occupies a period of years and only then are the toes partly destroyed.

Several of the patients applying for treatment were wearing arch supports, put on at institutions, regarding the affection as a type of flatfoot. In some the gangrene process began after an injury in cutting the nail of the great toe; in other cases after paring the corn on the small toe too closely. (There is a case for $25,000 now pending in court [Hamburger *vs.* Levy]

in which the gangrene extends from the cutting of a corn and amputation at the middle third of the tibia was performed.)

This sounds a warning to physicians as to the danger in this class of cases of any interference for ingrown toe nail, corns, etc., as the starting of a gangrene process.

The investigation of a number of similar cases shows that all local application and inward medication has afforded but little relief, and that a large number of amputations have been done to relieve the painful symptoms, in the hospitals of New York City.

In my own experiments, I found that the high frequency electric current, though it gave some relief, whitened the purple skin and seemed to cut off the circulation to such an extent and for so long a time that I feared an ulcer would develop at the spot.

Dry heat from 200 to 400 F. gave a relief of pain for a time, but no improvement to the gangrene; this was also true of hot water and normal salt solution carried to the patient's tolerance to this form of heat. Morphin or other anodynes fail to give relief of the pain.

CASE 8.—S. L., man, aged 39, Russian, a cutter, with no history of syphilis or tuberculosis, uses alcohol and tobacco moderately. He has one brother who was similarly affected, who at the age of 19 had the right leg below the knee amputated, and two years later, had his left leg amputated above the knee, since which time the brother has remained in good health with no extension of the process. The patient consulted me at the hospital in November, 1907, for a pain in the left foot which extended up the posterior part of the leg to the knee, which had begun two years before. He had not been able to work for six month, nor had he worn a tight shoe on the left foot for six months. For five months he had not slept in a bed but in a chair, and only for a short period at a time. When he was compelled to walk about to relieve the pain, the foot had constant pain which was accompanied by lightning-like radiating pains up the leg from time to time, being more frequent at night.

The foot was cold blue, with a beginning gangrene of the little toe; the arteries could scarcely be felt. The patient had already been given local heat to the feet by hot sand, salt and water, also with various local applications of salves and ointments together with internal medication, without permanent benefit or the arrest of symptoms. I determined to try the effect of the heat and light as obtained from a 500 candle power incandescent light. The heat was interrupted every few seconds, but only when he could no longer tolerate it; this was kept up for a period of fifteen minutes on his first visit. On his return the next day he declared he had slept during the night for a longer time than in months and without pain. I thought this was merely mental suggestion; I repeated the treatment daily for five days regularly, after which patient again wore shoes and continues to do so. The pain gradually disappeared, the gangrene in the little toe resolved and a new nail appeared, and the patient has been well without symptoms for the past six years. He has continued his treatment at home by means of a small lamp.

We have treated over 300 of these cases at the Hospital for Deformities and Joint Diseases, our present method of treatment consisting of the administering of one-fifth grain extract of thyroid three times a day, giving from 300 to 500 c.c. salt solution subcutaneously, and exposing the patient's foot for twenty minutes to white light to the point of tolerance of heat; I also advise exposure to sunlight when possible. This treatment arrests the process and stops the pain in a large number of these cases.

I have seen but two cases of obliterating endarteritis in American-born citizens.

CASE 9.—One foot of the patient had been removed at the Presbyterian Hospital for a similar condition. When they advised the removal of his other foot two years ago, he came under my observation. The process has been arrested, the pain has all disappeared under only white light treatment, and he is now able to attend to his work.

CONCLUSIONS

We can regard feet as normal only when the foot in action moves through the normal plan of action in relation to the leg. To have feet perform their normal function, nothing is more important than proper shoes. In adapting treatment for painful feet, we must determine whether we are dealing with an infection of the foot or a relaxed condition of the supporting structures.

If the pain comes on acutely, we have infection (except with trauma); if the pain is developed gradually, we have relaxation of the supporting structures.

The promiscuous application of foot plates has been condemned by many of the leading orthopedic surgeons. There is no doubt that there are many cases of painful feet due to strain that require some support under the arch. This can best be done by some yielding, springy substance, such as felt, much better than metal arch supports, and the sooner they can be removed, the better for the patient. The foot should have freedom of action in locomotion, not fixation.

ABSTRACT OF DISCUSSION

DR. ROBERT W. LOVETT, Boston: I wish to mention some work that I did and recently reported in THE JOURNAL, that some of you may have seen, in which I tried to make the point that the word "flat" foot was used too extensively, and that in many cases such feet were not flat. I called attention also to the fact that I personally believe more people have trouble from high arches than from low arches, and that the element of pronation did not come in. Dr. Whitman complimented me by taking issue with me, and held that pronation was a necessary element in painful feet. In the eight hundred cases examined, the ones that were pronated were not any more prone to pain than the ones that were nonpronated, and I personally do not believe that any man living can go through a hundred feet and pick out with any degree of precision the feet that are likely to be enduring under strain and the feet that are likely to give out under strain. Since I have been specially interested in this subject, I have been taking note of the people who come to my office for treatment for static difficulties in the feet. Of course, the causes that Dr. Frauenthal speaks of we have got to recognize definitely, but in regard to static pronation, I personally believe more people have trouble with high arches than with low arches.

DR. JOHN RIDLON, Chicago: I should like to ask that Dr. Frauenthal in closing explain a little more fully just what this white light is.

DR. EMIL S. GEIST, Minneapolis: I feel that a great many cases of so-called weak foot are erroneously diagnosed, and am of the opinion that these cases need as much care in examination and diagnosis as other human ailments receive in our offices. We are prone to dismiss these patients suffering from foot complaints without giving them sufficient thought and attention, prescribing merely an arch support, some exercises, and trusting to luck that they may get better. I believe if we look more at the matter of etiology, we will find that foot complaints can be divided into many classes, and that instead of the ordinary static problems, we will often have to consider many other etiologic factors in arriving at the best method of treatment in these cases of so-called weak foot. Of course, not all infectious arthritides are due to some focus situated in the mouth or its environs. However, we must frequently remove the possible focus, hoping that it may be the one which is giving

the trouble. If we do not cause general improvement, we will always cause local improvement at any rate. Another important point to remember is that many of us expect too much from the removal of a possibly diseased focus. We cannot expect a joint which has been riddled by disease for years to recuperate and resume normal function, merely because we have removed an infected tooth, for instance. The fire is over and the damage has been done. We must get on the ground with our fire extinguisher at any early hour and not wait until the fire is over.

Dr. Roland Meisenbach, Buffalo: In considering painful feet, we must remember that there are many causes, whether they be due to anatomic variations, static errors, infections, a lack of tone of the tissues, or following fractures in or near the feet, or a combination of the above. Dr. Frauenthal has enumerated many of these in his paper. He has, indeed, covered a vast field, and I am sure he will agree with me that he has only briefly touched on many of them. The successful treatment of painful feet surely depends on our being able to attack the cause as well as the effect. I especially think of the cases in which there may be infection far remote from the feet, that develop painful feet after the severe infection has subsided. I am inclined to believe that some of the local infections of the feet occur through the skin, by absorption. I do not believe it is possible for one to say dogmatically that plates are of no value. I know that there are types of feet that require the proper plates, and that there are other types of painful feet that should not have plates. In considering the question of plates, one should remember that plates are applied to feet for two reasons: First, to support the feet properly and make them functionate correctly, and secondly, to strengthen the foot structures. In order to make the feet functionate properly, the plates must be cut according to the symptoms, as well as to the anatomy of the foot, which are only understood by the surgeon who has studied the case. The plate should be of such flexibility that it will bring into play the very muscles or tissues of the foot and leg which the surgeon believes will strengthen the foot. I find that so many are wearing plates of a rigid type, so as to splint all the joints of the foot as well as actually to prevent muscular action. This is the wrong type of plate, and is found frequently in the shoe stores. Although at first they may give temporary relief, the ultimate result is to weaken rather than strengthen the foot. It should be remembered that plates should be applied only as an adjunct to any other treatment which may be necessary, either general or local. Even in cases in which we have exostoses or faulty function after fracture, plates may be of great value in obtaining the results.

Dr. E. A. Rich, Tacoma, Wash.: I should like to ask Dr. Frauenthal to state in his conclusion the rôle that the ordinary plate plays in his work.

Dr. E. W. Ryerson, Chicago: I am anxious to be convinced of the value of these light treatments. It seems to me, considering the matter from the standpoint of an ordinary, plain thinker, that electric light treatment for these painful osteo-arthritis cases, of which we all see so many instances, is the purest kind of bunk; but if it is true, I want to be convinced, and the recital of a few cases which have been benefited has not particularly convinced me. I should be very glad if Dr. Frauenthal would at some future date—say next year—present to us some really convincing scientific evidence of the value of the light treatment. There are lights and lights, and a whole lot of people are using this light and that light—and a white light is better than a blue light and a blue light is better than a white light, and personally, I do not know where we get off. If there is anything in it, I want to use it, but I have got to be shown.

Dr. John Ridlon, Chicago: What is that lamp called?

Dr. Henry W. Frauenthal, New York: Answering Dr. Ridlon, the light I use in my office is what is known as a lucodescent lamp. What I have my patients use is a small lamp they buy from the Edison Electric Company, costing $8. I try to get the patients in some house wired for electric light. The size of the lamp is of no importance, because you heat the feet up to the highest point of tolerance. I think we have a record of over three hundred cases. As a question of diagnosis, a number of these cases I have from time to time shown to Dr. Willy Meyer, who was interested in this particular class of cases. One of the gentlemen asked me what plate we use at the hospital. We do not use any plates. We use firm felt cut out to conform to the foot and elevated to support the arch, because it holds up firmly and is springy. That does not do for static feet. You must manipulate them, and then if you bake them and keep up your massage, some of them get to be fairly good feet. The type of foot to which I want to call attention particularly is that in which the trouble is due to secondary infection. In the last year we have observed a great many of these feet, and our class of women with painful feet is almost as large as our class of men. They get some relief at first by wearing a plate obtained at a drug store or at a shoe store, and then as they do not get any better, they apply to an institution.

THE STABILITY OF THE INFUSION OF DIGITALIS*

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It is generally recognized that the infusion of digitalis deteriorates rapidly; in fact, it is often stated that digitalis and all of its preparations undergo rapid changes. Several pharmacopeias, notably the German, French and Swiss, direct that the leaf shall not be kept longer than one year despite the utmost care in its preservation.

We have shown[1] that when the leaves are kept with the least care for periods up to twenty-five years, they retain a degree of activity equal to that of fresh leaves of good quality, and that a fluidextract made thirty years previously was quite as active as one of good quality recently made.

Digitalis is not completely exhausted in making the infusion by the official process, in which the bruised leaf is directed; hence this process was modified slightly and the infusions used in the present investigation were made as follows: Powdered digitalis of good quality was infused on a water-bath for one hour at a temperature of about 95 C. This process results in exhausting the powder almost perfectly, as shown by a subsequent test of the marc. Incidentally, it may be remarked that three infusions made in this way from the same specimen of powdered leaf during a period of six months showed activities of 97.5, 100, and 102 per cent., respectively, the second serving as the standard.

The infusion for the first series of tests was filtered while hot and divided in equal portions. Alcohol and cinnamon water were added to one portion according to pharmacopeial directions, and water (in place of the alcohol) and cinnamon water were added to the other, the two representing similar proportions (1.5 per cent.) of digitalis.

The hot infusions were put in bottles which were then securely corked, the contents being nearly sterile but not absolutely so. Several of the bottles that con-

* From the Laboratory of Pharmacology of Cornell University Medical College.

* The present investigation was undertaken at the request of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association.

1. Hatcher, R. A., and Eggleston, Cary: Am. Jour. Pharm., 1913, lxxxv, 203.

tained infusion made with alcohol were labeled A, and placed in the ice-box, the others that contained the hydro-alcoholic infusion were labeled B, and placed in an incubator in which the temperature was maintained at 37 C. Similarly, half of the bottles that contained the infusion made without alcohol were labeled C, and placed in the ice-box; the remainder, labeled D, were placed in the incubator.

The activity of the fresh infusion was tested by the cat method after 0.85 per cent. of sodium chlorid had been added to it. The specimens kept in the ice-box and those in the incubator were tested in the same way after varying intervals of time.

The cat method, in brief, consists in injecting the test-preparation slowly and continuously into the vein of a cat until death results. The weight of digitalis represented in the fluid used is calculated and is expressed in terms of milligrams of the drug per kilogram of animal weight. An amount of the fresh infusion representing 120 mg. of the drug was required per kilogram of cat used in the test.

When precision in the results is demanded, as many as six animals may be required for each test, because some animals are more tolerant than the average, and a few are unusually susceptible; but since slight changes in the activity of these specimens were not considered important, we used from one to four animals for each test.

This explains why some specimens of the infusion actually appear to be more active after having stood for a time, but these discrepancies are slight, and the total number of experiments performed suffices to insure results that are sufficiently accurate for the purpose in view.

In a few cases it was necessary to reject the results of single experiments owing to evident gross abnormalities of the animals. The following example will serve as an illustration: Four animals were used in a test, the figures obtained being 103, 105, 111, and 173 mg. per kilogram. In this case the calculation was based on the figures of the first three experiments, which were nearly uniform, the fourth animal being obviously tolerant.

In a few cases we were also forced to reject experiments, even though their inclusion would have given our results the appearance of greater uniformity. Thus Specimen 3 (Table 3), tested after an interval of seven days, had an activity corresponding to 103 mg. per kilogram, which was evidently too high, when viewed in the light of subsequent tests; another test of this specimen made on the same day gave 113 mg. per kilogram (agreeing exactly with the results obtained in the last test of that specimen), but we were compelled to reject the higher figure because one of the animals used was subsequently found to be lactating, and experience has shown that many lactating cats are remarkably tolerant toward digitalis.

Such irregularities are the exception, however, and in some tests none of the figures varied by more than 2 or 3 per cent. from the average. In one of these tests the figures obtained were 108 and 109; in another 115, 116 and 119. A typical test, in which four animals were used, gave the figures 105, 116, 117 and 122 mg. per kilogram, the average of these four being 115.

Table 1 gives the results obtained with the infusions previously described. The interval during which the specimen used in a given case was kept in the ice-box or incubator before being tested is expressed in days. The amount of digitalis represented in the infusion required is expressed in milligrams of digitalis per kilogram of cat weight. The number of animals used in each test is shown by the bracketed figure.

TABLE 1.—MILLIGRAMS OF DIGITALIS PER KILOGRAM OF ANIMAL

Specimens	Intervals in Days				
	3.	7.	14.	21.	28.
Freshly made 120 (3)					
A (alc., ice-box)	.....	115(2)	.....	129(2)	125(1)
B (alc., incub.)	116(2)	128(2)	135(2)	117(2)	154(2)
C (aq., ice-box)	.....	123(3)	113(2)	152(2)	149(2)
D (aq., incub.)	112(3)	155(2)	160(2)	153(2)	180(1)

Table 2 shows the activities of the infusions expressed in percentages, the initial activity of the fresh infusion being taken as 100 per cent. The figures showing the intervals in days correspond to those in Table 1.

TABLE 2.—ACTIVITIES OF INFUSIONS EXPRESSED IN PERCENTAGES

Specimens	Intervals in Days				
	3.	7.	14.	21.	28.
A (alc., ice-box)	...	104	...	93	96
B (alc., incub.)	103	94	89	102	78
C (aq., ice-box)	...	98	106	79	80
D (aq., incub.)	107	77	75	78	67

The results given in Tables 1 and 2 will be discussed later with those of other experiments.

It may be objected that infusion of digitalis is not commonly kept unopened, as our specimens were; hence we decided to subject the preparation to conditions more nearly simulating those found in practice, and also to extreme conditions such as could never obtain even with the greatest carelessness.

For this series of tests an infusion was prepared, June 24, 1915, essentially as previously described, except that distilled water was used in place of the alcohol and cinnamon water. The filtered infusion was then divided into several portions and placed in bottles while hot. These were labeled and kept for various periods of time under the following conditions:

1. Allowed to stand uncorked at room temperature.
2. Corked but opened three times daily and a small amount removed each time.
3. Securely corked and allowed to stand at room temperature during two and a half months of summer. The average temperature was 75.5 F.
4. About 10 gm. of floor sweepings were added to the contents of the bottle, which was then shaken thoroughly and allowed to stand at room temperature.
5. About 10 gm. of fecal matter from a cat's intestine was added to the contents of the bottle, which was then shaken thoroughly and allowed to stand at room temperature. This specimen developed an intensely disgusting odor, with the evident multiplication of micro-organisms.

The results of the several tests of these specimens are shown in Table 3. The intervals during which these specimens were allowed to stand were so variable that they are best given for each test; hence the figure under "age" indicates the number of days during which each specimen was kept before the tests. The figure under "dose" indicates the number of milligrams of digitalis in the infusion required per kilogram of animal. The bracketed figure shows the number of experiments in the test. The freshly prepared infusion represented 115 mg. of digitalis per kilogram of cat weight.

The following experiments, which cannot be tabulated conveniently, may be presented here:

An official infusion of digitalis that had been kept stoppered at room temperature (about 70 F.) for nineteen days was tested and found to be of exactly the same activity as when freshly prepared. After having been opened, it deteriorated slowly. A specimen of an infusion was allowed to stand open in an Erlenmeyer flask over a radiator for one month, water was then added to make up for the loss by evaporation, and when tested it was found to be about 50 per cent. less active than when freshly prepared. Another specimen of the infusion, to which chloroform was added, retained its full activity during a period of eighty days of summer, although the chloroform had completely disappeared when it was tested.

The rapid deterioration shown by the specimen which contained fecal matter (No. 5, Table 3) suggested the possibility that the colon bacillus might be concerned in the change. An infusion that had been prepared in the manner already described was therefore sown with a pure culture of the colon bacillus from the human intestine, 0.5 per cent. of Witte's peptone having been added to facilitate the growth of the organism, and the mixture was placed in the incubator for a period of nine days.

COMMENT

The most striking facts shown by our experiments are that an infusion of digitalis made without alcohol and kept without the least care, in fact, under more unfavorable conditions than could obtain in practice, may retain its activity with little impairment for periods varying from six to nineteen days; and that when the hot infusion is bottled with reasonable care, it will often keep practically unchanged for many weeks even during the summer.

We do not maintain that the infusion of digitalis is a perfectly stable preparation. On the contrary, it is not. Practically all vegetable infusions undergo deterioration when kept standing; but the idea has prevailed that the infusion of digitalis is especially unstable. There does not appear to be any basis for this belief.

The specimen made by the official process and kept in the ice-box for a period of four weeks retained its activity practically unchanged. That made without alcohol and kept cold lost nothing in two weeks; but these results are overshadowed by those obtained in the second series of experiments.

The specimen that was opened frequently, and kept under conditions much like those which obtain in practice, lost nothing in three weeks, and that is longer than an infusion should be kept on hand by a patient. It is surprising that a specimen mixed with sweepings from the floor should have retained its activity unimpaired while standing at room temperature for nearly three weeks. The slow deterioration of the specimen that had been planted with a pure culture of the colon bacillus is also noteworthy. Rapid deterioration was to be expected after the addition of fecal matter, and it is only surprising that the rate of deterioration was not greater.

TABLE 3.—ACTIVITIES OF INFUSION OF DIGITALIS KEPT UNDER DIFFERENT CONDITIONS FOR VARYING INTERVALS OF TIME

Specimen. Fresh 115 (4)	Age, Days	Dose, mg.	Age, Days	Dose, mg.	Age, Days	Dose, mg.	Ultimate Loss in Percentage
1. Uncorked	6	122 (2)	13	114 (2)	20	115 (2)	26 per cent. in 20 days
2. Opened frequently	8	122 (2)	21	98 (2)	...	...	None in 21 days
3. Corked, summer temp.	7	103 (3)	20	117 (2)	79	113 (2)	None in 79 days
4. Sweepings added	6	104 (2)	13	116 (3)	19	101 (2)	None in 19 days
5. Fecal matter added	5	147 (2)	12	164 (3)	18	194 (3)	40 per cent. in 18 days

At the end of that time it was tested in the usual manner and the activity compared with that of the freshly made infusion. It was found to have lost about 10 per cent. of its activity. While this difference is slight, it is interesting to observe that the activity was determined with a considerable degree of precision both before and after the period of incubation.

The following experiment may be described here because it bears directly on the problem in hand, though it was made during the course of an investigation begun about a year previous to the time of undertaking the one described in this paper:

Powdered digitalis was mixed thoroughly with an equal weight of water, placed in a glass-stoppered bottle and allowed to stand at room temperature for about six months, at which time it was found to be nearly inert. A mold had developed within a few days after placing the moist powder in the bottle.

This experiment was repeated in part, the moistened powder having been set aside, Nov. 24, 1914. It became moldy within a few days, but when tested, March 20, 1915, having stood about four months, it had lost only about half of its activity, and it is interesting to note that an infusion prepared from this moldy digitalis gave a blood pressure tracing that was typical of digitalis action. This is of especial interest in view of the commonly accepted opinion that moldy digitalis, and old aqueous infusions of the drug, develop principles having picrotoxinlike actions.

The results of our experiments may seem new and striking to the reader who is accustomed to hear much about the extreme instability of preparations of digitalis, and of the infusion especially, but thirty-seven years ago Prall[2] stated that the filtered infusion of digitalis will keep as long as it is ordinarily required by the patient. Two years later Binz[3] stated that the infusion decomposes owing to a mold, and that sometimes it keeps well and sometimes it does not. Certainly a moldy preparation should not be used therapeutically.

The question naturally arises why the infusion and other preparations of digitalis should be reputed to decompose so rapidly if they are actually as stable as we maintain.[1]

The chemistry of digitalis presents many difficulties to the investigator, and we do not know in what

2. Prall: Am. Jour. Pharm., 1878, p. 424, quoted from Proc. Am. Pharm. Assn., 1879, p. 72.
3. Binz, quoted from Proc. Am. Ph. Assn., 1880, p. 45.

form the active constituents exist in the leaf, or what changes and transformations of one active constituent into another take place during extraction and on standing.

The therapeutic use of this drug is also rendered difficult, partly by reason of the fact that it is necessary to use a dose that borders closely on the toxic in order to secure the full therapeutic effects, and partly because comparatively few physicians can become sufficiently expert in the treatment of cardiac disease to determine in difficult cases whether a given condition results from the progress of the disease, from insufficient dosage or from overdosage.

This difficulty is due to the fact that cardiac insufficiency and various types of irregularity are common in many forms of cardiac disease and digitalis overdosage even in the absence of cardiac disease, and, further, that the toxic actions of digitalis may be elicited without the appearance of any therapeutic effects.

The well-known disadvantages of digitalis have served as a constant stimulus to the exploitation of proprietary preparations of it, and many manufacturers have persistently exaggerated the disadvantages of the drug and its official preparations in order to magnify the advantages claimed for their specialties.

We would not be understood as advocating the general employment of the infusion of digitalis. It is necessarily of variable activity as obtained from different pharmacists, and it is probably also of varying degrees of stability as thus obtained. The actions of the infusion differ in no way qualitatively from those of the tincture or the leaf, and these can be obtained of more nearly uniform activity, and certainly of greater stability than the infusion. The dose of either is smaller, and we know of no indications whatever for the employment of the infusion in preference to these two.

CONCLUSIONS

1. The infusion of digitalis is fairly stable when prepared and kept with ordinary care, no important change then occurring within a week.

2. The addition of alcohol to the infusion is unnecessary.

3. Old, and even moldy, digitalis and its infusion may give the typical digitalis actions qualitatively so long as they retain any considerable degree of activity.

4. A properly made infusion of digitalis represents the leaf practically in its entirety, the action being qualitatively like that of the tincture.

5. Owing to the variability in activity of the infusion as it is commonly obtained, the tincture should be preferred to it in therapeutic practice.

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The Migration of Flies.—Recently Mr. George B. Harrison, president of American Balloon Pilots, said that flies had been encountered in strong air currents at high altitudes. He declared that on a recent trip, from southern Texas traveling north, they encountered an air current at about 5,000 feet altitude, going at the rate of about 60 miles an hour, and that a considerable number of house flies came into the basket of the balloon, being swept along in this tornado-like current. This observation leads to the inevitable conclusion that flies may migrate very great distances, and that in this manner infected flies may be the means of transmitting certain infectious diseases over a wide range of country.—*Kansas State Board of Health Bulletin No. 9*, September, 1915.

THE USE OF MERCURY SALICYLATE IN SYPHILIS

A RECORD OF ITS INFLUENCE ON THE WASSERMANN REACTION IN FIFTY CASES *

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The hypodermic use of mercury salicylate in the treatment of syphilis[1] is very general at present. In line with the study of the treatment of this disease we turned to this drug and in December, 1914, began to record our results of its use in syphilis as expressed by its influence on the Wassermann reaction.

Each patient here recorded has had at least two double plus serum reactions on different dates before being placed on this list. As in our previous reports on neosalvarsan and salvarsan, all the serum tests have been made by Captain Charles F. Craig, M.C., U. S. A., thus securing uniformity of technic and interpretation of results obtained. We feel that this adds materially to the value of the work. All cases on this list are fresh cases; that is, cases without previous treatment of any nature. This latter requirement brings forty-three of the fifty cases under the "latent" heading. The remaining seven cases reported are all cases in the secondary stage of the disease. It may be well here to recall the fact that this institution is a military prison where all the inmates are under restraint and lead well-regulated lives, with an abundance of fresh air, good food, regular hours and exercise.

Influences unfavorable to treatment are completely absent and the serum reactions have been influenced solely by the treatment given. Again, in these cases no other drug has been given at any time, it being our desire to have a clear-cut record of the effect of the mercury salicylate when used absolutely by itself. Our dose of the mercury salicylate has been the same in all cases, 100 mg. or 1½ grains.

In the beginning of the treatment we repeated the dose every seventh day. We at once found this interval too short, and so next attempted to give the dose every fourteen days. Here again we found it necessary at times to allow a longer interval between doses, and so came to rely on frequent examinations, with the administration of the dose as often as possible. None of the patients has been salivated, but it has required much care to avoid this. We have kept each patient full to saturation of the drug at all times. Bowels have been kept open by the use of salines when needed. Without exception all of the patients have daily performed their full quota of work. Sore buttocks have been complained of at times following the injections, but in no case has an inflammation resulted and they have always yielded promptly to massage. No one has been excused from work on this account. The treatment has not been seriously objected to by the men, but the injections are not without certain

* From the Prison Hospital, United States Disciplinary Barracks, Fort Leavenworth, Kan.

1. Nelson, K., and Haines, E. F.: Observations of the Results of Nine Months' Experience with Neosalvarsan at the U. S. Military Prison Hospital, Fort Leavenworth, Kan., THE JOURNAL A. M. A., March 28, 1914, p. 989; Observations of the Results of Seven Months' Experience with Salvarsan in the Treatment of Syphilis, THE JOURNAL A. M. A., Dec. 26, 1914, p. 2277.

unpleasant symptoms, and this form of treatment is not popular in this institution.

Objective symptoms yield to this treatment, but such symptoms yield far more rapidly to the salvarsan treatment, and any belief that the effect of the salvarsan treatment is prolonged — aided or reenforced by the mercury salicylate — is certainly no longer tenable. In the light of our experience it seems improbable that the salicylate alone and unaided possesses any real curative value in this disease.

In this institution mercury salicylate is at present the only treatment used and we can quote double the number of cases here reported if we use cases of patients who have had treatment before coming to us. The salicylate does not influence the serum reaction in these cases any more than it does in the cases here reported. In the table it will be noted that the serum reactions of some cases have varied from the double plus to the plus minus or minus, and later returned to the double plus while the treatment was in progress. It is our opinion that these variations in the serum reactions are due to other causes than the treatment.[2] For if they were brought about by the treatment, then why should the double plus reaction again appear when the treatment was being vigorously carried on?

MONTHLY RESULT OF WASSERMANN REACTIONS

Case Number	Date of Beginning Treatment	Stage of Disease	No. Doses Hg Sal. 100 Mg. Each	No. of Wassermann Reactions	Monthly Result of Wassermann Reactions							
1	12/ 7/14	Lat.	18	8	++	++	++	++	++	++	++	++
2	12/ 7/14	Lat.	10	6	++	++	++	—	++	+	....	....
3	12/ 7/14	Lat.	20	8	++	++	++	±	++	±	++	....
4	12/ 7/14	Lat.	14	7	++	++	++	++	++	±	++	....
5	12/ 7/14	Lat.	16	8	++	++	++	++	++	++	++	++
6	12/ 7/14	Lat.	16	8	++	++	±	—	+	—	±	++
7	12/ 7/14	Lat.	18	8	++	++	++	++	++	++	++	++
8	12/ 7/14	Lat.	20	8	++	++	++	++	++	++	++	++
9	12/ 7/14	Lat.	20	8	++	++	++	++	++	±	—	++
10	12/ 7/14	Sec.	16	6	++	+	±	+	—	++	....	....
11	12/ 7/14	Lat.	12	6	++	++	++	++	++	++	....	....
12	12/ 7/14	Lat.	12	6	++	++	++	++	++	++	....	....
13	12/ 7/14	Sec.	11	6	++	++	++	±	++	±	....	....
14	12/ 7/14	Sec.	18	8	++	++	++	++	++	+	++	++
15	12/ 7/14	Sec.	22	8	++	++	++	+	++	++	—	++
16	12/ 8/14	Lat.	19	8	++	++	++	++	++	++	±	++
17	12/ 8/14	Lat.	16	7	++	++	++	++	++	—	—	....
18	12/ 8/14	Lat.	16	7	++	++	++	++	++	+	+	....
19	12/ 8/14	Lat.	14	6	++	++	+	+	++	+	....	....
20	12/ 8/14	Lat.	18	8	++	++	++	+	—	—	±	++
21	12/ 8/14	Lat.	15	8	++	++	+	++	++	++	++	++
22	12/ 8/14	Lat.	13	6	++	++	++	+	+	+	....	....
23	12/ 8/14	Lat.	17	8	++	++	++	++	++	++	++	++
24	12/ 8/14	Lat.	12	6	++	++	++	—	+	—	—	....
25	12/ 8/14	Lat.	18	8	++	++	++	++	+	+	±	++
26	12/ 8/14	Lat.	17	8	++	++	++	++	++	+	++	++
27	12/ 8/14	Lat.	20	8	++	++	++	+	+	+	±	++
28	12/ 8/14	Lat.	18	8	++	++	++	±	++	+	++	++
29	12/ 8/14	Sec.	19	8	++	++	++	+	+	++	++	++
30	12/ 8/14	Lat.	10	8	++	++	++	++	++	++	++	++
31	12/ 8/14	Lat.	11	6	++	++	++	+	+	±	....	....
32	12/ 8/14	Lat.	13	6	++	++	++	++	++	+	....	....
33	12/ 9/14	Lat.	19	8	++	++	++	++	++	++	++	++
34	12/ 9/14	Lat.	20	8	++	++	++	++	++	++	++	++
35	1/11/15	Lat.	13	6	++	++	++	++	++	++	....	....
36	1/11/15	Sec.	8	4	++	++	++	+	....	....	....	....
37	1/1 /15	Lat.	15	6	++	++	++	+	—	++	....	....
38	1/12/15	Lat.	9	4	++	++	++	++	....	....	....	....
39	1/26/15	Lat.	15	6	++	++	++	—	++	++	....	....
40	2/21/15	Lat.	10	6	++	++	++	±	++	++	....	....
41	2/21/15	Lat.	7	5	++	++	++	++	++	....	....	....
42	2/21/15	Lat.	11	5	++	++	++	+	++	....	....	....
43	2/21/15	Lat.	11	6	++	++	+	++	++	++	....	....
44	2/21/15	Sec.	10	5	++	++	++	++	++	....	....	....
45	2/21/15	Lat.	12	5	++	++	++	±	++	....	....	....
46	2/21/15	Lat.	10	5	++	++	++	++	++	....	....	....
47	2/21/15	Lat.	17	6	++	++	++	++	++	....	....	....
48	3/21/15	Lat.	11	6	++	++	++	++	++	....	....	....
49	3/21/15	Lat.	11	5	++	++	+	++	++	....	....	....
50	3/21/15	Lat.	7	4	++	++	++	++	....	....	....	....

We hesitate to say that we consider the unaided mercury salicylate treatment of syphilis to be without value, but feel that its value is so slight as to make it unworthy of the time spent in its administration.

If we accept the Wassermann reaction as an indication of the presence of syphilis and of value as a guide in the control of the disease by treatment, then it is certainly fair to believe that mercury salicylate used hypodermically in full doses over many weeks of time has little if any real influence on the disease. In the table will be seen Cases 17 and 24, giving two and three negative serum reactions. In both cases the men obtained clemency and were discharged from the prison at this period of treatment and we were unable to follow them further. It is our belief that a continued record in these two cases would undoubtedly have shown a positive reaction later in the treatment. Had they failed to do so they would have been the first to so record this treatment, for just this thing did occur in Cases 2, 3, 6, 9, 10, 15, 20, 25, 37 and 39. This also clearly establishes the value of more than one serum reaction and the error that would arise from the acceptance of a single negative reaction as final.

2. Craig, Charles F.: Variations in the Strength of the Wassermann Reaction in Untreated Syphilitic Infections, THE JOURNAL A. M. A., April 18, 1914, p. 1232.

CAUSE AND PREVENTION OF CONSTITUTIONAL SYMPTOMS FOLLOWING DEEP ROENTGEN THERAPY

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Since the introduction of the measured massive deep dose in Roentgen therapy, certain more or less unpleasant symptoms following the exposures have been observed. The symptoms are chiefly of a systemic nature. With the production and use of rays of greater penetration, these symptoms have been accentuated. These constitutional after-effects of the massive deep treatments are not merely annoying, but often become distressing and even dangerous. This is especially true when the patients are aged and debilitated or when the patient is cachectic, asthenic or toxic as a result of the presence of malignant, ulcerating or suppurating lesions about the body. The after-effect of the roentgenization is often especially marked in neurotic patients or in patients who have just been subjected to operative procedures. It is an old observation that patients suffering with alterations in the cellular content of the blood or with diseases of the blood-making organs are prone to develop unpleasant symptoms of a distinctly toxic nature after Roentgen-ray treatment.

The symptoms following deep Roentgen-ray therapy vary greatly with the general condition of the patient, with the nature and extent of his disease and with the amount of the Roentgen-ray dosage. The mildest type is an indefinite malaise felt for a day or two after the treatment. It may be so marked, however, as completely to prostrate the patient, necessitating rest in bed from one or two days to a week following each massive treatment. This malaise is often accompanied by marked nervousness and mental depression.

Nausea and lack of appetite are almost constant accompaniments of the malaise, and may result in vomiting. The patient may vomit but once (usually from

two to six hours after the treatment), or the vomiting may persist for days. One robust female patient who had just been operated on for cancer of the breast was unable to retain any food, except water, for eight days after a single treatment. The treatment was quite severe, however, and consisted of eight full doses (200 X); 100 X were administered to the operated side, and 100 X to the unoperated and apparently normal side. (It may not be out of place to mention in this connection that postoperative Roentgen-ray treatment of the breast should never be confined to the operated side but should include the unoperated or apparently normal side. The reasons are obvious.)

With the nausea the patients usually associate the odors of the ozone or other gases formed about the high vacuum tube excited by a high voltage current. Many of them report that the odor lingers with them, producing nausea, or that the sight or even the thought of the treatment, or of the apparatus, or of the operator recalls the mental impression of the odor and results in nausea. I have frequently encouraged patients to describe the unpleasant odor; but, as a rule, no adequate description could be obtained. One patient said that the odor suggested something "burnt;" another described it as resembling the odor experienced when emerging from an ether anesthesia.

The nausea and consequent loss of appetite frequently result in a loss in weight and strength, and may in this way be a factor in prognosis. One patient under treatment for an inoperable carcinoma of the colon lost from 2 to 3 pounds in the two or three days immediately following each treatment. In the intervals before the next treatment he gained from 3 to 5 pounds only to lose part of it again following each succeeding treatment. Another patient insisted on being treated on Mondays, as according to his statement he wanted to enjoy his Sundays.

While the malaise and nausea are the two most prominent symptoms following the massive deep treatments, a variety of other symptoms may appear. There may be rapid swelling of the lymphatic glands in the irradiated areas occurring from two to six hours after the treatment. This swelling of the lymphatic glands following the Roentgen-ray treatment was so marked in one goiter case that the condition was diagnosed mumps and the patient was isolated by the attending physician.

Patients frequently complain of a metallic taste in the mouth for some days after the Roentgen-ray treatment, and are unable to enjoy the flavor of their food. There may be also edema and congestion of the mucous membranes in the areas under treatment, resulting in dryness of the mouth and throat, pain in swallowing, soreness of the intestines, etc.

It should be understood that the foregoing syndrome occurs only when massive doses are employed, and may never appear if the dosage be mild or moderate. But such mild or moderate dosage is often futile in that it fails to accomplish the desired result. If the larger doses are employed, however, these unpleasant symptoms may decrease the weight and strength of the patient or may be so alarming to the patient that he will discontinue the treatment against advice. The practical importance of overcoming these constitutional after-effects is, therefore, evident.

In the search for the cause of these symptoms, the fact that the patient complained of the disagreeable odor in the treatment room directed attention to the gases formed about the tube. Therefore, I tried to overcome the possible effect of these gases by placing a jar of smelling salts near the patient or placing a small bottle in the patient's hand for inhalation during the treatment. This was without appreciable effect on the undesirable symptoms. I then observed that with the onset of warmer weather and the opening of the windows, the patients seemed to complain less of the nauseous odor. An electric fan was, therefore, placed in an open window and the air current was directed to the patient's face. This decreased the nausea, but did not entirely prevent it.

I found that it was always possible to limit or prevent these after-effects by decreasing the dosage, but more especially by decreasing the voltage at the tube terminals. When 9 milliamperes were passed through the tube and from 25 to 30 X delivered per area, the symptoms were very pronounced. When only 5 ma. were passed through the tube and from 15 to 20 X given per area, the symptoms were milder and often absent altogether.

It was further observed that the constitutional symptoms appeared not during or immediately after the treatment, but required from two to twelve hours to develop. Furthermore, the patients suffered most after being under treatment for some time, that is, after the thorough saturation of the tissues by the Roentgen ray and the development of the cumulative effect. It was also apparent that, although the odor in the treatment room produced a recurrence of the nausea, this was only a mental reflex and not the ultimate cause of the nausea. The first treatment produces no *immediate* nausea. At subsequent treatments, however, the odor recalls the nausea, since the patient associates the treatment and its accompanying odor with the nausea.

The effect of the Roentgen ray on living cells is to break them down or at least to increase the catabolic changes in the cells. The products of the metabolic activity in living cells or of the disintegration of protein material are largely acid in reaction. It seemed probable, therefore, that the unpleasant constitutional symptoms following deep Roentgen-ray therapy were the result of an acidosis either local or general. It is known that the reaction produced in the skin by the Roentgen ray is a local acidosis from cellular disintegration, and that it can best be avoided or abated by the local application of the alkalies (as, for instance, Dodd's lotion).[1]

A few clinical tests seemed to prove the correctness of this theory. The administration of sodium bicarbonate by mouth served to ameliorate or prevent the constitutional symptoms in a great many patients. The first patient on whom this medication was carried out was very anemic and weak from uterine hemorrhage due to the presence of a fibroid. Her general condition was such that the possible constitutional after-effects of the treatment were greatly feared. She was given sodium bicarbonate in 30-grain doses every three hours for twenty-four hours previous to the treatment, and this medication was continued for forty-eight hours after the treatment. None of the unpleasant symptoms developed in this case.

I am now prescribing as a routine 30 grains of sodium bicarbonate every three hours, to be continued forty-eight hours after each treatment. When the condition of the patient warrants, it is also given over

1. Dodd's lotion consists of: zinc oxid, one-half ounce; glycerin, 1 dram; phenol (carbolic acid), one-half dram; lime water, 8 ounces.

twenty-four hours just previous to each treatment to increase the alkalinity of the blood and tissues. The patient is also encouraged to drink freely of alkaline waters, especially Vichy. I prescribe also in each case an alkaline lotion (Dodd's formula) to be applied twice daily to the skin areas under treatment as a prophylactic measure against the development of a reaction, and I feel that, as a result of the persistent use of this lotion from the beginning of the treatment to the end, I have been able to increase the skin tolerance and to deliver in this way a greater dose to the underlying tissues than would otherwise be possible.

The dose of alkali which I have been giving is perhaps in excess of what is required, and may be cut down to an amount sufficient to render the urine alkaline. If 5 grains of magnesium sulphate be added, the dose may be further diminished. A bottle of artificial Vichy per day is sometimes sufficient.

5 Garfield Place.

PYORRHEA DUE TO ORGANISMS OTHER THAN THE AMEBAS

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Since the publication of the work of Bass and Johns on pyorrhea, there has seemed to be a tendency among dentists and many medical men to administer emetin in all cases of dental infections without establishing the presence of the endameba. That the endameba is not the cause of all cases diagnosed as pyorrhea by competent dentists is shown by the history of such cases as that outlined below. Its publication at this time seems, therefore, justified.

History.—A. L., man, aged 18, high school student, first seen Aug. 2, 1912, complained of attacks of sore mouth complicated by fever, earache and knee pains. The family history was negative except for tuberculosis in the second generation on the mother's side (no contact). The patient had been a healthy infant until 3 months of age, when he had otitis with a purulent discharge. The sore mouth began at the age of 3 years, when the attacks began suddenly and recurred every three weeks. He had the usual children's diseases, but was in spite of it all a healthy-appearing child.

Present Illness.—A febrile attack of stomatitis, glossitis or gingivitis (or all three) occurs every fourteen days and lasts from three to five days, ending with the removal of one or more necrotic nodules about one-eighth inch in diameter. His ears "break" and "run" at longer intervals (for example, four times in the last seven years). His left knee swells up and pains him about five days from every four to eight weeks.

The attack begins with a general malaise and fever, followed by a soreness of the mouth, gradually localizing into a swelling of the mucous membrane of the particular part affected. In the center of this area develops a raised nodule, red, hard, but not very tender. This can be seized with forceps and pulled out at the end of from three to five days without much discomfort to the patient, leaving a clean granulating surface. No distinct scar is left. The attacks recur without reference to habits, time of year or food. The knee attacks began last year.

Examination.—The patient is a sturdy young man, self-controlled and showing no neurotic stigmata. The weight varies from 142 to 150 pounds. Systolic blood pressure, from 150 to 138. Chest shows some roughened respiratory sounds. Heart sounds loud and sharp. Lymph glands palpable in neck, axilla and groin. (The cervical glands swell at the time of the attacks.) Spleen not palpable. Ears negative except for scars on membrane. Nasopharynx red and "sticky." Mouth shows about half of the teeth gone and some of the remainder loose. The inflammation about the teeth has gradually destroyed the alveolar processes of most of the teeth, so that the roots are exposed. In some cases pus exudes from the socket on pressure, but in most cases none appears because of the frequent cleanings at the hands of the dentist. Left knee shows now little or no inflammatory disturbance.

Aug. 12, 1912, the lower lip was swollen and red. Attack began two days ago. The right ear was discharging. Malaise was still increasing; pulse, 108; temperature, 101. Bad taste in mouth. Pain in right ear, lip, gums. Tongue flattened and coated with a glairy membrane that could be washed off with an astringent spray, leaving a reddened and glossy mucosa. Culture from ear showed a small diplococcus.

In the interval following this attack the patient was given a course of "rheumatism phylacogen." No result, beyond the temporary chills and malaise.

Following his next attack, a course of stock staphylostreptococcic vaccine was given (a course of autogenous vaccine had been given eighteen months previously). The following attack (October 2) was almost free from the constitutional symptoms, and only one nodule appeared; the next attack, however, was about as usual (October 22). The vaccine treatment was continued, but without distinct effect. Attacks were at their height November 6, 13 and 27. The bacteriologic study of this last nodule showed long rods and various cocci. December 2, an autogenous vaccine (Hecker) was started. In spite of this an extraordinarily severe attack occurred from December 14 to 18.

Jan. 11, 1913, the patient was just over a week's attack; fever to 101; two ulcers on left side of tongue, one on lip, one on buccal-gingival fornix; all on left side of mouth. In this attack the invasion was slow and stopped for two days. Interval between attacks now sixteen days.

January 17, there was "rheumatism" of left knee and fingers of left hand. This cleared up in three days, but the knee was more or less sore in the evening for a month.

The last attack of otitis occurred January 25, and lasted only two days.

March 15, a culture made from the depths of a freshly pulled necrotic plug showed on potato in twenty hours a mold—a closely felted, adherent white growth with black spot in center; small branching colorless mycelia with conical spores. On blood serum, a looser growth, mycelia white, sporangia yellowish. On agar the growth was white with ovoid spores, but when transplanted to potato became black (*Aspergillus niger*). In glucose bouillon, filaments (leptothrix?) with vibriolike forms.

April 4, a culture from material from the depths of the ulcer immediately after the nodule had been pulled out in glucose bouillon showed chains of minute sporelike bodies and a few cocci.

April 17, the pseudomembrane on the tongue showed mycelia under the microscope.

May 31, the "rheumatism" that had been prevailing since May 23 stopped when the plug developed in mouth yesterday.

After attempting to eradicate the sores by curettage and caustics, it was found that the nodules appeared about the tooth sockets or on the parts of the tongue coming in contact with the bad teeth.

Oct. 29, 1913, culture from the bottom of a plug showed a rich growth of *Aspergillus fumigatus*. But a smear from the same plug showed masses of a minute diplococcus, and through them threads smaller than an ordinary mycelium, which stained blue with Wright's stain.

Jan. 2, 1914, a tooth was extracted. From the root a culture showed a diplococcus, a staphylococcus and a streptothrix, all decolorized by Gram.

February 24, ulcer in anal fold. Inguinal glands enlarged and tender. A sore in left buccal mucosa opposite last lower molar, and one on tongue. (Patient has had two or three of these anal ulcers before. They occur coincidently with the oral lesions.)

March 19, culture on blood serum from the depths of an oral ulcer grew at room temperature a rod that united in long myceliumlike branches, not decolorized by Gram.

March 21, 1914, a vaccine made from these cultures was started. This caused some systemic reaction, but seemed to bring on the knee inflammation.

May 22, 1914, neosalvarsan, 0.9, intramuscularly.

June 1, 1914, new attack, as before.

Aug. 31, 1914, withdrew 35 c.c. of clear fluid from left knee. Culture showed a diplococcus not decolorized by Gram and the branching sporulated organism already found in the mouth.

Dec. 15, 1914, all his teeth except the two last lower molars removed. This brought on a severe attack with much hemorrhage from the sockets, which continued intermittently until December 20.

Aug. 13, 1915, the patient has been much better and has lost very little time from his university work. But the attacks still recur at seventeen-day intervals. He is now suffering from another ulcer in the anal fold.

Summarizing the record, we have to do with a recurrent fever of about seventeen years' duration. The focus has been the alveolar processes and the mucosa of the mouth, from which the body has been invaded. The particular parts, aside from the mouth, which have shown evidences of infection, have been the left knee (bursitis) and the anal fold (abscesses). The length of the attacks has varied from three to ten days. The organisms most constantly found have been a diplostreptococcus and a mold. The disease has proved resistant to arsenic (salvarsan, arsacetin and the trioxid), the salicylates and other systemic and local germicides, as well as to vaccines, both autogenous and stock, single as well as mixed.

The question of great interest is whether we have to do with an organism showing a cycle of from fourteen to seventeen days, or whether it is a case of temporary immunity. Repeated examinations have failed to reveal any amebas. Animal inoculation was negative.

To me it would appear that the causative organism is one which is ordinarily nonpathogenic, but which has acquired parasitic power in the tissues of this patient.

It is perhaps needless to say that all the conventional drugs have been used at one time or another by the various physicians who have treated the patient. The dentists employed have been the best in the city. The case was worked up from the dermatologic standpoint by Dr. R. L. Sutton,[1] and published under the caption, "Periadenitis Mucosa Necrotica Recurrens." The diagnosis of pyorrhea was given by all the dental attendants, including Dr. Frederick Hecker, the author of a monograph on that subject.

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1. Sutton, R. L.: Jour. Cutan. Dis., 1911, xxix, 65.

Anthrax.—Anthrax was not a reportable disease in Pennsylvania prior to 1905 according to Dr. Andrew A. Cairns, chief medical inspector of the Philadelphia Bureau of Health. Previous to that time the death rate from anthrax was high. Since 1905 progress has been made in the treatment of the disease so that the death rate is now much less. In 1905 there were seven cases with one death; in 1906 nine cases with three deaths; in 1907 fifteen cases with four deaths; in 1908 four cases with three deaths; in 1909 nine cases with one death; in 1910 eight cases with two deaths; in 1911 two cases with one death; in 1912 ten cases with three deaths; in 1913 nine cases with three deaths; in 1914 nine cases with four deaths. For the first eight months of 1915 there were no deaths from anthrax in the city. In thirty-five cases recorded in the hospital for contagious diseases all the patients except five recovered.

THE TREATMENT OF CEREBROSPINAL SYPHILIS: THE OGILVIE TECHNIC

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The trail of pioneer students in the last decade has led us into a wilderness of speculation and argument concerning the pathology and treatment of syphilis, especially of the late forms. Whether our combined attack with the old remedy and the brilliant new therapeutic weapon destroys the enemy or wins a truce, whether persistently negative findings in both serum and arachnoid fluid ever guarantee the death of the ultimate spirochete—these questions may be answered after forty years of wandering. Meanwhile certain facts in the pathology are becoming clear, and quite definite ideals of treatment may be held.

The underlying pathology of parasyphilis does not differ essentially from that of primary syphilis; but while a scarred foreskin is of no physiologic moment, a scarred optic nerve is a tragedy. We must probably, however, recognize both spinal and cerebral syndromes resulting from processes degenerative in type from the time of the first diagnostic symptoms. These perhaps follow years of nutritional disturbance, from relatively symptomless vascular disease long since quiescent, and are analogous in development to similar degenerations observed in primary anemia, plumbism and other toxemias in which syphilis can be excluded; or figuratively, to the gradual yielding of an aortic scar under hydraulic stress. These cannot be much benefited by any known treatment. Furthermore, remembering the sensitiveness of the cerebral cortex to even small traumatic cicatrices, it is not surprising that in paresis great or lasting improvement is obtained only in patients treated intensively in the very earliest stages.

Syphilis is generalized, including the cerebrospinal localizations, at latest soon after the appearance of the chancre; more often without it, and without the secondary reaction, than is generally believed. Whether trauma, intoxications, allergy, or some unknown phenomenon in the life cycle of the parasite later kindles into activity these foci in the nervous system, we do not know. It is perhaps significant that central nerve syphilis in the secondary stage before the discovery of salvarsan, as well as syphilis neurorecidive, has been observed most often in people acquiring syphilis late in life, when it is reasonable to suppose the normal slight ependymal permeability to biologic antibodies and specific drugs is diminished by early senile change. Whether the process is disseminated by metastasis or by extension alone from the primary localizations, we cannot be sure; we are sure that every syphilitic is a possible candidate for tabes or paresis until his last spirochete is killed.

Therefore, and because most effective in the early stages, treatment of the late forms begins, paradoxically, with the microscopic diagnosis of the chancre. In justified enthusiasm for the specific drugs, we are prone to forget the value of psychotherapy, never more essential than in the treatment of syphilis. The drug treatment is mercury by injection or inunction, and salvarsan intravenously, as intensive and continuous as may be without disturbing the general health, until clinically, serologically, and in the cytology and

biochemistry of the arachnoid lymph, there is no evidence of active disease. This means, for example, ten injections of mercury and six of salvarsan in about four months, followed, in the absence of symptoms, by two months' rest, when the tests should be made. If negative, and in the absence of symptoms, these should be repeated twice a year for several years. In tertiary syphilis moderate doses of iodids in addition are unquestionably of symptomatic benefit.

Since we failed of our hoped for *therapia magna sterilisans* with the single large dose of salvarsan, our careless and unscientific use of this drug, so potent for good or ill, is amazing. Evidence abounds that we achieve just as much with smaller and less frequent injections. The initial dose should not exceed 0.3 gm. The interval should rarely be less than ten days.

Latent syphilis with laboratory findings in the cerebrospinal fluid remaining strongly positive after one repetition of the course outlined should be treated intrathecally. Of this I am firmly convinced. The occasional patient with sufficient intelligent appreciation of his danger to offer his apparently healthy body as vicar of a diseased test tube is exactly the one whose activities it is most worth while to conserve.

The Wassermann test, unreliable and unstandardized as it is, is probably our best guide, and cerebrospinal syphilis should be treated locally, intravenously, or both, according to findings in serum and arachnoid fluid.

The Ogilvie method of arachnoid salvarsanization, in spite of its obvious advantages and excellent results, seems not to have won so wide a recognition as it deserves. By this technic, patients for whom general salvarsanization is no longer indicated avoid the discomfort, the probable harm, of large intravenous doses, as well as the repeated venous puncture. Dosage is accurate, the method economical of a drug expensive and at present difficult to obtain. The Ogilvie injection in my hands proves less disturbing to the physiologic economy than the Swift-Ellis treatment. Finally, this technic offers the more than academic advantage of answering the critics who believe the supposed benefit of subdural injections to result from the accompanying intravenous administration.

I have treated a baker's dozen cases of tabes and meningitis by Ogilvie's technic with about the same results as others have reported. Two of these I submit, not because they show the most brilliant result, for they do not, but because they illustrate points of especial interest, or perhaps justify radical views.

Wassermann tests are by Dr. T. P. Tredway, attending pathologist to Hamot Hospital, and Dr. E. C. Jagle, in Dr. Fordyce's laboratory.

Case 1.—Tabes. A saloon keeper, aged 51, until four years prior to being seen was a hard drinker, had a chancre twenty years previously, followed by mucous patches, for which he received no specific treatment. Eight years previously he had lightning pains and ataxia. In 1912, when he first consulted me, a condition of blurring and dim vision was improved by eight intravenous injections of salvarsan. During the last two years he has had detrusor insufficiency, emptying his bladder only once in twenty-four hours; loss of sexual power, and increasing ataxia. His disease has been characterized throughout by agonizing pains in the legs and about the waist. Until March, 1914, he received from me twelve intravenous injections of salvarsan and six courses of mercury by injection and inunction. During March he had four Swift-Ellis treatments which he thought were of no benefit. In fairness to the method I must admit that neosalvarsan was the drug used for these treatments. I regret that at this time I was not familiar with the pathology of the spinal fluid. After this he consulted other physicians, receiving osteopathic treatment and mercury injections through the summer and fall of 1914.

In February, 1915, when he consulted me again, he was on the point of giving up all activity. He could scarcely get about with the help of a cane, suffered with severe gastric crises and lancinating pains, which he controlled with 4 or 5 grains of morphin hypodermically every day. He showed the classical signs. February 11 the serum Wassermann was negative, the arachnoid fluid showing cells 45; globulin + + + ; Wassermann + + + with 0.5 c.c.

On this date he was given 0.25 mg. salvarsan subdurally, while suffering a gastric crisis. This dose was, under the circumstances, twice too large, and the reaction was severe and alarming. Ten days later he felt better than at any time during the previous two years.

March 1, feeling perfectly well, he received 0.1 mg., followed by a very mild reaction. March 23, returning to the large dose, he had 0.25 mg., which he bore without much distress. April 16 this injection was repeated, and the fluid phases were found to be normal.

April 20 he spaded in his garden for two hours and danced a little in the evening without mishap. His morphin he had by this time reduced to ¾ grain daily.

In July he complained of pains again, I believe in the hope of a larger morphin allowance, and received 0.25 mg. of salvarsan intraspinously. The fluid showed no abnormalities.

September 23. He walks wherever he pleases by day or night without a cane, empties his bladder without difficulty several times daily. He has not vomited for seven months, and has had practically no pains. He takes up to 1 grain of morphin daily, "because he is nervous without it." He can stand with his eyes closed, which he could not do two years ago. The pupil and tendon reflexes have not returned, and his sexual power is gone.

This man's process advanced steadily and fairly rapidly during three years until he was almost a hopeless bedridden morphinomaniac, in spite of systemic treatment as strenuous as anyone could be asked to endure, besides four Swift-Ellis injections. Tests of his fluid were characteristic of active disease. For the past seven months he has enjoyed very fair health and an ordinarily active life. By his own effort he reduced his morphin by more than three quarters. He has received five intrathecal injections of salvarsan by the Ogilvie technic; no other treatment of any kind, medicinal, mechanical or educative. His cerebrospinal fluid is normal.

Case 2.—Latent syphilis. A lawyer of 35, single and of good habits, consulted me in 1912 with the history of a possibly specific sore without secondaries twelve years previously, and a positive serum Wassermann. During the next eighteen months he had nine intravenous injections of salvarsan and four courses of thirty mercury inunctions. The Wassermann remained triple plus, the patient "in smiling health, in spite of the disease and in spite of the treatment."

In February, 1914, the pupils became unequal. He received mercury injections until May, then two intravenous injections of salvarsan, no further treatment until July, when he had pains and tingles in hands and forearms and across the back, and the pupil responses to light became sluggish. Mercury injections were resumed until September, when he had one Swift-Ellis treatment, 20 c.c. serum with 10 c.c. saline. Meningism required rest in bed for ten days. At this time the serum Wassermann was doubtful, the fluid showed cells 35, globulin abundant, Wassermann complete with 0.2 c.c. A second Swift-Ellis treatment was followed by blurring vision (Herxheimer reaction, or temporary paresis from irritation?). Dr. I. J. Dunn reported normal fields and disks.

October 15, 1914, this patient was referred to Dr. J. A. Fordyce, who found the pupil changes and also noted exaggerated tendon reflexes in the left leg. He advised a series of eight intravenous injections, the patient to report to him after this course.

January 15, by Dr. Fordyce: Patient profoundly hypochondriac; serum Wassermann negative, cells 4, globulin excess very marked, inhibition complete with 0.4 c.c., the important phases thus slightly affected by two Swift-Ellis injections and eight intravenous. No change in the signs. Patient received 0.25 mg. intraspinally, by Dr. Fordyce, followed by a moderate reaction lasting four days. In February this injection was repeated by Dr. Fordyce, the phases in the fluid showing some improvement.

Since then this patient has been in vigorous mental and physical health. He has received at my hands three subdural injections of 0.25 mg. each, at eight-week intervals. The serum Wassermann remains negative; that in the fluid has become weaker by almost perfect arithmetical progression with each injection, to practically normal. The patient has no symptoms; the signs are perhaps slightly improved.

It is but fair to credit the clinical improvement under the Ogilvie injections to the psychic effect of kindly reassurance by a wise and recognized authority, for the real subjective symptoms cleared up under Swift-Ellis and intravenous injections at my hands, the signs remaining stationary. For the local treatment may justly be claimed the return to normal of the spinal fluid, for I do not believe psychotherapy ever rendered a Wassermann negative. From the complete arrest of the process in this case it seems reasonable to believe that if local treatment had been instituted before the appearance of clinical signs and symptoms, their onset might have been postponed, perhaps indefinitely, and the patient spared a psychical upset which made him useless for several months.

My field is too small to yield any large harvest of conclusions. Ogilvie's study seems to me the great advance in the therapy of syphilis since Ehrlich's discovery; his technic the method of choice in the local treatment of cerebrospinal forms of this disease.

SOME CLINICAL MANIFESTATIONS OF FOCAL INFECTIONS

SVERRE OFTEDAL, M.D.

FARGO, N. D.

Focal infection as a definite factor in diagnosis and treatment has become well established, through the work of Rosenow, Billings, and others; it is no longer in the experimental stage. The clinical manifestations come under the eye of the observing practitioner almost daily. In our clinic at St. Luke's Hospital it has become a matter of routine to search carefully for foci of infection and to demonstrate their presence wherever possible. Some interesting observations have come to light which it seems might be worthy of publication. The following cases are cited, because each seems to illustrate a certain phase or phases of the subject:

CASE 1.—A. T., a boy of 12, came to my office in July, 1912. He had been suffering for several years with chorea, which, in spite of the usual treatment, rest in bed, Fowler's solution, etc., had been growing more and more severe. The eyes were continually rolling from side to side, the head was always changing position, and other muscles of the body were jerking constantly. General nutrition was poor; there was a slight mitral lesion, and a rather indefinite history of sore "throat." Tonsils were of the embedded variety and apparently not enlarged. Examination was otherwise negative. The tonsils were extirpated and the left was found to contain pus from which a streptococcus was isolated. The boy was put to bed, Fowler's solution being prescribed in increasing doses. In five weeks twitchings had all ceased, and patient seemed to have made a perfect recovery.

The supplementary treatment was given because it was deemed unjustifiable to withhold any measure that might contribute to the patient's recovery. Since this treatment had been given previously without effect, however, there seems to be little room for doubt that the real cause for recovery lay in the extirpation of the tonsils, the focus of infection.

CASE 2.—R. G., girl, aged 13, entered the hospital in August, 1915. She had been subject to attacks of tonsillitis for several years. About a year ago one of these attacks was associated with rheumatic pains and swelling of the joints, which, however, subsided, being followed by several other severer attacks at intervals until about seven weeks ago, when she entered the hospital. At that time the child was greatly emaciated, and had the typical appearance and symptoms of a severe endocarditis. The tonsils appeared to be innocent, being of apparently normal size and color. For several weeks the temperature ranged between 102 and 104 F., salicylates and other medication being given without any apparent effect. A bacteriologic examination was then made of the tonsils. From the crypts of the left tonsil was obtained a slight amount of pus, which yielded a pure culture of a green-producing streptococcus under anaerobic cultivation. It was decided that the tonsils must be removed, in spite of the poor condition of the patient. Under local anesthesia this was successfully accomplished. Both tonsils were of the size of a large hazelnut; the right was apparently normal in structure, but the left contained considerable quantities of pus. The left tonsil was emulsified under aseptic precautions and the emulsion suspended in salt solution, injected into three rabbits, varying quantities being injected intravenously. The first animal died of anaphylactic shock shortly after injection; the second died about eight hours after injection with every symptom of an overwhelming septicemia, streptococci being isolated from the blood in great numbers. The third rabbit had been given a very small dose and showed no noticeable symptoms until about two weeks later, when an inflammation of one of the joints developed. The following few days the animal grew gradually worse, and was chloroformed. There was considerable fluid in the pleural, peritoneal and pericardial cavities, the latter containing a flaky deposit. The heart was dilated and flabby, and the mitral valve showed retraction and a small hemorrhage. From the blood and serous fluids was isolated the *Streptococcus viridans*.

Meanwhile, the day following extirpation of the tonsils, the patient complained of a severe pain over the right kidney. The urine, which had hitherto been normal, showed the findings of an acute hemorrhagic nephritis. On cultivation, under great precautions, a pure culture (anaerobic) of a green-producing streptococcus was obtained, corresponding in every way to that obtained from the left tonsil. A vaccine was prepared and given at intervals of six days. After two injections the urine had again become normal, while the temperature gradually diminished.

This case is given in detail because it seems to demonstrate conclusively the source of the infection. These two cases also are illustrations of the so-called "embedded" tonsils whose innocent appearance will often deceive even the specialist.

CASE 3.—Mrs. M, aged 31, entered the hospital in June, 1915. About four weeks before, the patient was attacked with pain and swelling of certain joints, particularly of the fingers, wrists, ankles and toes. About a week later she observed a breaking out of the skin. She consulted a physician, who prescribed the usual treatment for rheumatism, but without much improvement. Patient finally entered the hospital, and was found to be suffering with acute articular

rheumatism, associated with a rather severe erythema multiforme. A careful examination was made for a primary focus of infection. The only positive findings were two adjoining teeth (anterior molars) which had been carefully filled, but which were a little loose and slightly tender, yet had given no serious trouble to the patient. It was advised that these be extracted, but consent of the patient could not be obtained for a week, during which time large doses of salicylates were given, with no apparent effect whatever. The patient finally decided to part with the teeth, which were promptly extracted. That night the patient enjoyed a comfortable sleep for the first time since the illness began. In three weeks she left the hospital perfectly cured.

Cultures made from the alveolar abscess found at the root of one of the teeth yielded a pure culture of a streptococcus, having a slightly hemolyzing colony and growing in short chains.

Case 4.—Miss J. J., aged 18, came to the hospital in July, 1915, complaining of a severe headache, and pain in the left knee and over the heart. Patient had had attacks of pain over the heart previously, also headaches for some time, but had not before been troubled with "rheumatism." The knee was found to be slightly swollen and tender; there was a murmur over the apex; the pupils were considerably distended. Temperature 101. Examinations of teeth, tonsils and nose were negative. She was referred to a specialist for a careful examination of the sinuses, and these were found to be apparently normal. A daily inspection of the throat was made, with no results until one day when the patient said she felt somewhat better. A considerable quantity of a greenish, thick pus was found to be discharging down the posterior pharyngeal wall. Cultures were made and a streptococcus isolated, from which a vaccine was prepared. Patient began to improve after the first injection of the vaccine, and after five doses had been given she had apparently made a complete recovery.

This case emphasizes the fact that a focus of infection may often be overlooked, even by a competent specialist, when seated in the upper sinuses. A daily inspection for discharging pus seems to be the only recourse in such cases.

HEMATEMESIS FOLLOWING APPARENT ACUTE INDIGESTION

REPORT OF A CASE OCCURRING IN AN INFANT

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J. F., a male child, aged 2 months, weighed at birth 6½ pounds. Though of small size he was apparently healthy. He was bottle fed from the beginning as the mother (quintipara), having secondary anemia from severe postpartum hemorrhage after each delivery, was never able to nurse.

The present illness began during the hot days of August, with vomiting, diarrhea, and fever. The abdomen was distended, the child was very restless and cried continually. After the second day the temperature became normal, vomiting ceased, the bowels were constipated; abdominal distention and pain alone remained. On the fourth day the child passed into a state of semiconsciousness (respirations were interrupted and of the Cheyne-Stokes type). On the fifth day he passed a large watery stool; the distention was much less, the respirations became quiet and regular, the condition of stupor disappeared, the eyes appeared bright, and a better color returned to his skin. About 3 p. m. on the fifth day the child became suddenly weak and pale but in a few minutes appeared much better. About 4:30 p. m. he vomited about a teaspoonful of dark brownish fluid. The child, however, continued apparently to gain strength until 6:30 p. m. when it suddenly vomited a very large amount of blood, dying while vomiting.

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Therapeutics

THE MORPHIN HABIT

(Concluded from page 1817)

OBJECTS OF TREATMENT

1. To stop the drug.
2. To prevent pain and cause sleep.
3. To increase all secretions.
4. To sustain the strength.
5. To support the heart.
6. To teach self-control.
7. To promote nutrition and general health.

These are the main objects that one must keep in mind, and they also represent some of the difficulties in the cure of the morphin habit.

DETAILS OF METHODS OF TREATMENT

Towns-Lambert Method.—The details, as described by Dr. Lambert, are as follows:

The morphin patient is given five compound cathartic pills and 5 grains of blue mass. If these have not acted in six hours, he is given a saline cathartic. After three or four free movements, he is then given in three divided doses at half-hour intervals, two-thirds or three-fourths of his total twenty-four hour morphin or opium dose. The drug is given in the way he usually takes it. After the second dose, Lambert cautions the physician to study the patient carefully, as a few patients cannot comfortably take more than this amount, and should not receive the third dose of morphin. Beginning at the same time that the first dose of morphin is given, 6 drops, from a medicine dropper, of the belladonna, xanthoxylum and hyoscyamus mixture above described are given, and this dose is repeated every hour for six hours. At the end of six hours the dose is increased by 2 drops. This belladonna mixture is then continued every hour, day and night, continuously throughout the treatment, increasing 2 drops every six hours until the dose has reached 16 drops; this 16-drop dosage is then continued. The belladonna drops are diminished, or discontinued, at any time that the patient shows symptoms of belladonna poisoning, which is evidenced by dilated pupils, flushed face, dry throat, or "a peculiar incisive and insistent voice and an insistence on one or two ideas." It would seem as though the dilated pupils and dry throat would be present early in almost every case. If the belladonna treatment has been stopped, it is again begun at a reduced dosage as soon as the symptoms have subsided. If there is idiosyncrasy against belladonna, it will be shown in the first six or eight hours, and the dose must then be diminished. If 16 drops, the full dose, given for twelve consecutive hours do not cause dryness of the throat, the dose should be increased to 18, and to 20 drops per hour, and when the throat is dry, the dose should be reduced.

Ten hours after the first dose of morphin, the patient is again given five compound cathartic pills and 5 grains of blue mass. If they do not act in eight hours, a saline cathartic should be given. When the bowels have acted thoroughly, one half of the dose of morphin given at first should be given. As just stated, the belladonna drops are still being continued, and ten hours after the second dose of morphin has been given, that is, about the twenty-eighth hour of treatment, five more compound cathartic pills are given and 5 grains of blue mass, followed again by a saline if the

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bowels do not act in eight hours. After the bowels have thoroughly acted from the last dose of cathartics, the third dose of morphin is given, which should be one sixth of the first dose. It is stated that usually this will be the last dose of morphin required.

Ten hours after the third dose of morphin, that is, at about the forty-sixth hour, five compound cathartic pills and 5 grains of blue mass are again given, followed by saline, if needed, and at this time, if not before, a bilious green stool should appear. When this appears, usually about eighteen hours after the third dose of morphin or about the fifty-sixth hour of treatment, 2 ounces of castor oil are given to clean out the intestine. Sometimes, Lambert states, it is necessary to continue the belladonna mixture over one or two more cathartic periods before giving the oil.

During the last bowel-moving period the patients are the most uncomfortable, and their excessive nervousness and discomfort may be controlled by codein, "which can be given hypodermically in 5-grain doses and repeated, if necessary; or some form of valerianates may help them." It would seem very doubtful if valerianates could be mentioned in the same category with a 5-grain dose of codein. The valerianates have never been shown to have any activity whatsoever.

At about the thirtieth hour of treatment, the patient should be stimulated with strychnin or digitalis, or both, every four to six hours. The amount of strychnin is not mentioned; neither is the amount nor the preparation of digitalis. Digitalis should rarely be given at four-hour intervals. This cardiac stimulation is left entirely to the judgment of the physician who is caring for the patient.

It is stated that some patients cannot tolerate the codein, as it causes poisoning, and urticarial rash, etc. Such patients may receive ethyl-morphin hydrochlorid, and Lambert thinks that the latter is twice as strong in its activity as codein, and he thinks the dose should be "2 or 3 grains, or less." The dosage of this drug, according to New and Nonofficial Remedies, is from one-quarter to 1 grain. The codein or dionin, whichever is given, should be stopped as soon as possible after the castor oil has acted, although it may be given during the succeeding twenty-four hours if necessary, but it should not be continued more than forty-eight hours, as they will acquire this habit, or return to the morphin habit.

Joint and other pains, and bone and muscle aches, Lambert says, "can sometimes be relieved by hypodermics of some form of ergot and strychnin, sometimes by massage, sometimes by sodium salicylate, sometimes by a salicylic compound combined with some of the coal-tar products, such as antipyrin or acetphenetidin; and they can always be eased by codein or dionin. The addition of codein to these coal-tar products increases their analgesic effect." Of course, it does, and it would seem almost inexcusable, if morphin is being withdrawn, to continue codein or ethyl-morphin hydrochlorid for more than one or two doses. The choice of these drugs is apparently left to the physician in charge of the patient. It would seem that the more drugs, the worse for the patient. All coal-tar products are depressant and are dangerous for a heart, especially after it has been through the trials it must go through in the two or three days of this treatment.

Insomnia, Lambert says, may be treated sometimes with bromids, sometimes with chloral or some other hypnotic. Veronal, he says, has caused much depression. Any of these hypnotics must cause some depression. He states that as soon as the patient is up and about, muscular fatigue caused by regular exercise makes him sleep, and usually such exercise can be taken at the end of a week.

The Pettey Method.—On the first day of the treatment the patient may take his usual dose of morphin, but he must go without his dinner and supper. Pettey's cathartic prescription, which contains atropin and strychnin as above described, is divided into four doses and placed in capsules. The patient takes one of these capsules every two hours, beginning at 4 p. m. The following morning he receives no nourishment and no morphin until his bowels have thoroughly moved. To insure that they do move, about 5 a. m. the next morning he is given one-twentieth grain of strychnin hypodermically (although he already has had one-fourth grain of strychnin since 4 p. m. the day before). Half an hour later he is given 2 ounces of castor oil or the contents of a bottle of magnesium citrate. Both the strychnin and the oil or saline should be repeated every two hours until the intestinal canal has been thoroughly emptied, and no morphin should be given during this time. It would certainly seem as though a morphin patient was very tolerant to strychnin, and it may be that he is sustained by this large dose of strychnin during the first period of going without his morphin.

After the bowels have freely moved, and the craving for morphin becomes insistent, the patient should be given from one half to two thirds of his usual dose of morphin at the same intervals at which he has been accustomed to take the drug. After this free purging he may have plenty of food regularly, provided he eats nothing for six hours before he begins his second purgative treatment, which should be at the end of forty-eight hours from the first. The cathartic capsule should be given in the same way as on the first day. The morphin may be continued in reduced dose, just sufficient to keep the patient comfortable, until the last dose of the cathartic capsule has been given, when it it is stopped, and no more opiate should be given. From six to eight hours after the second purgative course has been completed, strychnin hypodermically and the oil or saline should be repeated as before. As soon as the patient feels the need of the morphin after this second free purging, instead of morphin or an opiate, he is given $\frac{1}{200}$ grain of scopolamin hypodermically, and this is repeated in thirty minutes. If the patient does not sleep after the second dose, a third may be given in half an hour or an hour, which may be of the same amount, or double the amount, depending on the effect. This large dosage of scopolamin will cause either sleep or a mild intoxication. In either case the patient will not suffer. As soon as he wakes, he is given another $\frac{1}{200}$ grain of scopolamin, and this atropin intoxication should be repeated, if necessary, to keep the patient free from pain, for from thirty-six to forty-eight hours after it was begun. It should then be stopped. During the scopolamin period and for twenty-four hours afterward, Pettey gives 20-grain doses of sodium thiosulphate every two hours, which he thinks supplements the effect of the calomel purgative.

Convalescence is established on the fifth to the sixth day, when medication should cease, except treatment aimed at improving the general condition of the patient. During the treatment a weakened circulation is treated by Pettey by giving spartein sulphate in doses of 2 grains, every four to six hours.

Sceleth Method.—Patients treated by this method are first given a saline cathartic, and then the mixture of scopolamin, pilocarpin, ethyl-morphin hydrochlorid and cascara sagrada in the combination described previously. The dose varies according to the amount of morphin the patient is taking. When more than 10 grains of morphin per day are being taken, Sceleth gives 60 minims every three hours, day and night, for six days. On the seventh day the dose is reduced to 30 minims; on the eighth day to 15 minims, and on the ninth day 15 minims three times a day instead of every three hours day and night. On the tenth day this treatment is stopped, and strychnin nitrate, one-thirtieth grain, three times a day is substituted. On the eleventh day the strychnin is reduced to one-sixtieth grain three times a day, and this is continued for a week. During the first five days he gives a very light diet, but liquids freely.

Patients who are taking less than 10 grains of morphin a day start with a dose of 30 minims of the mixture; and if less than 5 grains, 15 minims.

This treatment represents the substitution of ethyl-morphin hydrochlorid for morphin; the fighting of the morphin depression by scopolamin; the necessary promotion of secretions by pilocarpin, and the necessary laxative treatment by cascara. In other words, *this is apparently the simplest and most rational treatment of the three.*

During the first three days of the treatment the patients of course are sleepless, and they may vomit; but these symptoms occur with any treatment. If the pulse goes below 40 or above 120 per minute, the scopolamin mixture is stopped, and if there are any signs of collapse, one-half grain of ethyl-morphin hydrochlorid, or one-quarter grain of morphin is given hypodermically. The same is true of any treatment; if collapse is in evidence, morphin must almost invariably be given.

Sceleth says that in only about 4 per cent. of the cases is there scopolamin delirium, and when such a condition occurs the scopolamin may be omitted from the mixture for a few doses and then added in small doses. He further says what is very laudable, namely, to use no other drugs during the treatment. By the fifth day the patient generally has no further desire for his morphin and is ready for food, and may have a ravenous appetite and gain weight rapidly.

Sceleth very wisely says that if the cause that developed the morphin habit is still present, these patients are likely to relapse; if the cause that developed the habit has been removed, the patients are generally permanently cured. Consequently, if the cause that developed the habit has not been removed, it is a subject for the most careful therapeutic and, if necessary, surgical consideration. There certainly is little use in putting a patient through the serious ordeal for the cure of the morphin habit if recurrent severe pain is sure to occur.

The physician is urged to study the action of the drugs employed in the treatment of the morphin habit, and it is recommended that he first try the Sceleth method, which would seem to be the least dangerous, to cause the least hardship, and probably has as good a percentage of cures as any other treatment.

THE COCAIN HABIT

Often a patient who has the cocain habit also takes morphin; therefore frequently the two habits must be treated at once. In any case the cocain is stopped abruptly, the same elimination by free catharsis is necessary, and supporting treatment, especially with strychnin, is important. The combination of the cocain and morphin habits is perhaps the hardest one to cure, and Lambert says that as soon as the morphin is reduced the patients become delirious, and often almost unmanageable.

Any one of the methods described for the cure of the morphin habit may be used to cure the double habit, as just stated, the cocain being stopped immediately.

SYMPTOMS OF COCAIN POISONING

The local anesthetic symptoms need not be described. The symptoms after absorption, in a patient who is not used to the drug, vary greatly; many are excited mentally and are very loquacious, some may become slightly exalted or even delirious. The heart and respiration become more rapid, the pupils may dilate, and there may be some headache. The reflexes are likely to be exaggerated. There may be some slight trembling. Other patients are prostrated and become very faint, and even may become collapsed, if too much cocain has been absorbed. Vomiting may occur, but is perhaps rarely present unless the cocain is applied accidentally or intentionally to the pharynx, when the sensation of a foreign body in the pharynx, due to the anesthetized area, may cause reflex vomiting. The primary stimulation of cocain is not dissimilar to that of atropin.

Individuals who take the drug frequently, and become accustomed to it, receive mental stimulation from the cocain not dissimilar to that caused by caffein. They also, before they have been injured by the drug, may have more muscle endurance, and are fatigued less easily and can abstain longer from food without depression. Part of this action is doubtless due to the increased activity of the heart with some rise in blood pressure, and to the stimulation of the medulla oblongata and the spinal cord, all causing increased nervous tension. Sooner or later, depending on the particular individual, reaction sets in, the blood pressure falls, and the person becomes irritable, languid and weak.

In animals at least, and probably to a large extent in man, the cocain is almost entirely destroyed in the system, only a small amount being excreted by the kidneys.

Cocain is a poison. It more or less interferes with the secretions, digestion and finally nutrition. The cocain habitué becomes sleepless, nervous and tremulous, and may have hallucinations or become really insane. As stated, the main danger from the withdrawal of the drug is cerebral excitation and cardiac weakness.

(To be continued)

School Inspection.—In seventeen of the twenty-five states there is no organized health inspection of rural schools under competent authorities. In Idaho, Utah, Colorado, Pennsylvania, New Jersey and Virginia there is such an organized system, and the statistics for the rural schools are kept distinct from those of the city schools. In Maine and Rhode Island city and county records are listed together, a distinct disadvantage in determining the condition of the nation's schools. In no states other than these mentioned is there health inspection for the rural districts. In a commonwealth so advanced in educational matters as Massachusetts there is no health inspection of rural schools.—Dr. Philip Sumner Spence, *Public Health*, September, 1915.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

ETHYL BROMIDE (See N. N. R., 1915, p. 25).—The following non-proprietary preparation has been accepted:

Ethyl Bromide Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

HOMATROPINE HYDROCHLORIDE (See N. N. R., 1915, p. 57).—The following non-proprietary preparation has been accepted:

Homatropine Hydrochloride Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

SODIUM CACODYLATE (See N. N. R., 1915, p. 49).—The following non-proprietary preparation has been accepted:

Sodium Cacodylate Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

IODOTHYRINE (See N. N. R., 1915, p. 219).—The following dosage form has been accepted:

Iodothyrine Tablets, 3 grains.—Each tablet contains iodothyrine 3 grains. Prepared by Farbenfabriken, vorm. Friedr. Bayer & Co., Leverkusen, Germany (The Bayer Company, Inc., New York).

THYRESOL (See N. N. R., 1915, p. 277).—The following dosage form has been accepted:

Thyresol Pearls, 5 grains.—Each pearl contains thyresol 5 grains. Prepared by Farbenfabriken, vorm. Friedr. Bayer & Co., Leverkusen, Germany (The Bayer Company, Inc., New York).

THEOCIN-SODIUM ACETATE (See N. N. R., 1915, p. 375).—The following dosage form has been accepted:

Theocin-Sodium Acetate Tablets, 1½ grains.—Each tablet contains theocin-sodium acetate 0.1 Gm. (1½ grains). Prepared by Farbenfabriken, vorm. Friedr. Bayer & Co., Leverkusen, Germany (The Bayer Company, Inc., New York).

EMETINE HYDROCHLORIDE (See N. N. R., 1915, p. 107).—The following dosage forms have been accepted:

Ampuls Emetine Hydrochloride, Mulford, ½ grain.—Each ampule contains emetine hydrochloride 0.005 Gm. (1/12 grain). Prepared by H. K. Mulford Co., Philadelphia.

Ampuls Emetine Hydrochloride, Mulford, ⅓ grain. Each ampule contains emetine hydrochloride 0.02 Gm. (⅓ grain). Prepared by H. K. Mulford Co., Philadelphia.

Ampuls Emetine Hydrochloride, Mulford, ⅔ grain.—Each ampule contains emetine hydrochloride 0.04 Gm. (⅔ grain). Prepared by H. K. Mulford Co., Philadelphia.

SODIUM CACODYLATE (See N. N. R., 1915, p. 49).—The following dosage forms have been accepted:

Ampuls Sodium Cacodylate, Mulford, 1½ grains.—Each ampule contains sodium cacodylate 0.1 Gm. (1½ grains). Prepared by H. K. Mulford Co., Philadelphia.

Ampuls Sodium Cacodylate, Mulford, 3 grains.—Each ampule contains sodium cacodylate 0.2 Gm. (3 grains). Prepared by H. K. Mulford Co., Philadelphia.

QUININE AND UREA HYDROCHLORIDE (See N. N. R., 1915, p. 260).—The following dosage form has been accepted:

Ampuls Quinine and Urea Hydrochloride, 1%, Mulford.—Each ampule contains 5 Cc. of a sterile 1 per cent. solution of quinine and urea hydrochloride. Prepared by H. K. Mulford Co., Philadelphia.

MERCURIC SUCCINIMIDE (See N. N. R., 1915, p. 201).—The following dosage form has been accepted:

Ampuls Mercury Succinimide, Mulford, ⅛ grain.—Each ampule contains mercury succinimide 0.01 Gm. (⅛ grain). Prepared by H. K. Mulford Co., Philadelphia.

CALCIUM PEROXIDE (See N. N. R., 1915, p. 230).—The following non-proprietary preparation has been accepted:

Calcium Peroxide, P. W. R.—Manufactured by Powers-Weightman-Rosengarten Co., Philadelphia.

MAGNESIUM PEROXIDE (See N. N. R., 1915, p. 231).—The following non-proprietary preparation has been accepted:

Magnesium Peroxide, P. W. R.—Manufactured by Powers-Weightman-Rosengarten Co., Philadelphia.

SODIUM PEROXIDE (See N. N. R., 1915, p. 232).—The following non-proprietary preparation has been accepted:

Sodium Peroxide, P. W. R.—Manufactured by Powers-Weightman-Rosengarten Co., Philadelphia.

STRONTIUM PEROXIDE (See N. N. R., 1915, p. 233).—The following non-preprietary preparation has been accepted:

Strontium Peroxide, P. W. R.—Manufactured by Powers-Weightman-Rosengarten Co., Philadelphia.

ZINC PEROXIDE (See N. N. R., 1915, p. 234).—The following non-proprietary preparation has been accepted:

Zinc Peroxide, P. W. R.—Manufactured by Powers-Weightman-Rosengarten Co., Philadelphia.

SODIUM PERBORATE (See N. N. R., 1915, p. 277).—The following non-proprietary preparation has been accepted:

Sodium Perborate, P. W. R.—Manufactured by Powers-Weightman-Rosengarten Co., Philadelphia.

FORMIC ACID (See N. N. R., 1915, p. 141).—The following non-proprietary preparation has been accepted:

Formic Acid, Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

AGAR AGAR (See N. N. R., 1915, p. 22).—The following non-proprietary preparations have been accepted:

Agar Agar Powder, Merck.—Agar Agar in the form of a coarse powder. Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

Agar Agar Shreds, Merck.—Agar Agar in the form of shreds. Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

BERBERINE HYDROCHLORIDE (See N. N. R., 1915, p. 58).—The following non-proprietary preparation has been accepted:

Berberine Hydrochloride, Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

FLUORESCEIN (See N. N. R., 1915, p. 132).—The following non-proprietary preparation has been accepted:

Fluorescein, Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

MERCURY CYANIDE (See N. N. R., 1915, p. 198).—The following non-proprietary preparation has been accepted:

Mercury Cyanide, Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

POTASSIUM MERCURIC-IODIDE (See N. N. R., 1915, p. 203).—The following non-proprietary preparation has been accepted:

Mercury and Potassium Iodide, Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

TYPHOID VACCINE (See N. N. R., 1915, p. 324).—Swan-Myers Company, Indianapolis.

Swan's Typhoid Bacterin (No. 44) (Prophylactic).—Marketed in packages of three 1 Cc. vials, of which one contains 500 million, and the other two each 1 billion killed typhoid bacilli; also in packages of six 1 Cc. vials, two of which contain each 500 million, and four vials contain each 1 billion killed typhoid bacilli.

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THE INHERITANCE OF ABNORMALITIES

Modern science has clearly demonstrated that many conditions once ascribed to hereditary factors can no longer be regarded as inherited. The overwhelming majority of the cases cited as instances of the influence of maternal and paternal impressions on bodily features are clearly not cases of inheritance in the strict sense; for the "impression" has almost always been reported to occur after conception. Mutilations are no longer believed to be capable of transmission by inheritance. More significant than all of these instances, however, is the demonstration, due to the modern science of bacteriology, that there is no such thing as the true inheritance of specific infectious diseases. The accepted etiologic rôle of micro-organisms in these pathologic conditions has excluded the possibility of a hereditary smallpox, tuberculosis or syphilis, for example. At first, when the untenability of the older views became apparent, it was customary to refer to the inheritance of a "tendency" to these diseases, of a "weakened constitution" especially predisposing to them. When the true mode of transmission of the infections became better understood, it was easy to see that in some cases, at least, what is "inherited" is an unfavorable hygienic environment—an opportunity for exposure to the dangerous surroundings that had been the real menace to the victims of a previous generation, rather than disease itself.

To say that "specific infections are not inherited, but are of postconceptional acquirement" does not by any means imply that there is no inheritance whatever of conditions which have a pathologic significance. Familial inheritance of abnormal conditions is too common to have escaped notice. The growing interest in the scientific aspects of heredity and the development of a real experimental science of genetics have put new enthusiasm into the study of human anomalies of all kinds — to peculiarities or perversions of anatomic form, temperament, mentality and metabolism. The investigation of the mendelian and other theories of inheritance has disclosed so much of importance that it has become popular among medical writers to subject instances of alleged "constitutional tendencies" to the critical analysis of succession demanded by the newer hypotheses.

Certain qualities seem to be transmitted from parent to offspring either completely or not at all. The manner in which such characteristics are transmitted follows a plan, in many instances, familiarly known as Mendel's law. This postulates certain characters as dominant and others as recessive. If both characters relating to a particular part or function are present together in one individual, the latter will exhibit the dominant type. Many characters can be brought under this law; but in some cases the mendelian principle seems to fail. Thus in man the progeny of a cross between a white and a black race are more or less intermediate between the two in color. The offspring are frequently of various degrees of brownness, rather than definite black or white individuals.

Enough has been indicated to suggest the importance of considering supposed hereditary defects from the standpoint of these modern hypotheses. Among recently considered cases belongs the constitutional tendency to brittle bones. Weakness of the long bones may arise from a number of pathologic conditions affecting the bones, but the typical fragilitas ossium or osteopsathyrosis runs through families. An examination of a large number of family histories by Davenport and Conard[1] shows clearly that heredity in osteopsathyrosis is typically direct, that is, the factor which determines the irregular bone formation is a dominant one. The view that it is due to "some disturbance of metabolism of the mother" is disproved by the instance of twins, described by Schwarz and Bass; one twin showed osteopsathyrosis at birth while the other did not. The rare exceptions to the rule that a generation is not skipped are explained by the well-known principle of imperfection in dominance or possibly by a lack of knowledge of an infantile condition of a parent. That osteopsathyrosis depends on a single dominant factor is further indicated by the fact that the proportion of children in an affected fraternity that shows osteopsathyrosis is approximately half—actually 55 per cent. According to these investigators of the Eugenics Record Office, Davenport and Conard, the presence of biotypes can be recognized. In some families the slightest pressure results in fracture; in other families the bones are fairly resistant. The commonest bone to break is the femur; but in some families the humerus seems especially weak, and in still others the clavicle is frequently broken. Thus, associated with the imperfect bone development are special family traits which modify the result.

Expressing the outcome of these studies in a somewhat different way, it appears that of a parent exhibiting the features of hereditary fragility of the bones in early life, at least half of the children will be similarly affected. But if neither parent, though of affected

1. Davenport, C. B., and Conard, H. S.: Hereditary Fragility of Bone, Proc. Nat. Acad. Sc., 1915, i, 537.

stock, has shown the tendency, then expectation is that none of the children will have brittle bones. Moreover, when a parent is affected, it is possible that his children will show the tendency at about the same time of life, in the same bones and to the same degree as he himself showed it. Davenport and Conard state that an association of osteopsathyrosis with blue sclerotics has often been pointed out. The condition of blue sclerotics also appears to be a dominant trait.

In similar ways the relation of digital abnormalities to pedigree has been investigated by Manson.[2] Such peculiarities as syndactylism and polydactylism require no special skill in diagnosis, so that statements regarding them are likely to acquire a considerable degree of accuracy. Manson has obtained the statistics of the descendants of a man living in Wales about the beginning of the nineteenth century who was affected with webbing of the third and fourth fingers of the hand, and had six toes on each foot. Of the sixty-four descendants investigated, twenty-seven were affected with similar abnormalities, thirty-three were unaffected, and four were doubtful. Both the syndactyly and the polydactyly appear as a dominant character. The abnormality appears in the offspring of an affected parent, and either sex may transmit it. The offspring of unaffected parents are always free from it.

In the family here reported on, sesamoid bones are present in the majority of the affected hands at the second, third and fourth metacarpophalangeal joints where they are not usually present in normal hands. Inasmuch as these bones are frequently present in embryonic hands, Manson infers that in the affected hands the processes of absorption are below normal.

THE ACIDITY OF THE GASTRIC SECRETION

It is somewhat surprising that the remarkable contributions to physiologic science by William Beaumont were not promptly followed by a succession of studies in the same field. For many years—almost to our own generation—writers on medical subjects related to digestion were content to quote the findings and the conclusions of the pioneer American physiologist as the final verdict. Nevertheless, it was clearly understood in Beaumont's time that his statements were by no means to be implicitly adopted. Thus we read: "The rapidity of digestion, as the author himself shows, varies greatly according to the quantity eaten, the amount and nature of the previous exercise, the interval of the preceding meal, the state of health and of the weather, and also the state of the mind. But in scarcely any of the experiments have these conditions been carefully noted." [3]

Good clinical usage should be based on sound physiology. Recently a revival of interest in gastric physiology has occurred, beginning with the widely quoted work of the Russian physiologist Pawlow. Carlson of Chicago has contributed a series of fundamental observations which have been referred to from time to time in THE JOURNAL. Attention has been directed to the fact pointed out by Boldyreff[4] that the actual acidity of the human gastric juice is considerably greater than that which the customary figures reported after the examination of a test meal would lead one to surmise. In conformity with this, Carlson[5] has also demonstrated, notably in two cases of gastric fistula in man, that normal human gastric juice (appetite secretion), when secreted above a certain minimum rate, shows a practically constant total acidity of nearly 0.5 per cent. hydrochloric acid, or the same as the gastric juice of the dog. According to Carlson, this uniform and constant acidity is true for man only in regard to the "appetite, digestion and hunger juice," secreted at a fairly high rate. He states that we must take cognizance of the equally important fact that the normal gastric mucosa is capable of secreting a juice of submaximal acidity. The contents of the "empty" stomach, and the continuous or hunger secretion (when the secretion rate is low) have a uniformly lower acidity than the appetite juice. The total acidity of contents of the "empty" stomach is about 0.2 per cent., in terms of hydrochloric acid, a figure frequently given by clinicians as the acidity of the pure gastric juice of normal persons. When the secretion rate becomes higher, the acidity increases, but never exceeds that of the juice which flows under the stimulus of the appetite.

According to the foregoing facts, the normal human gastric juice, provoked by a suitable stimulus, is equal in total acidity to the maximum acidity reported by clinicians for so-called hyperacidity in man. Carlson insists that there is no evidence that the gastric glands under any pathologic condition are able to or do secrete a juice of higher than normal acidity. In fact, the presence in the stomach of gastric juice of full acid strength leads, by itself and immediately, to no untoward symptoms.

Why, then, are figures lower than 0.5 per cent. so frequently and commonly found for gastric juice? Boldyreff[6] believes that the most important factor in lowering the acidity of gastric juice from that actually secreted by the gland (0.5 per cent. as hydrochloric acid) to that usually found in the cavity of the stomach (0.25 per cent.) is the entrance of intestinal contents (pancreatic and intestinal juice and bile) into the stomach. Carlson, who accepts this interpretation,

2. Manson, J. S.: Hereditary Syndactylism and Polydactylism, Jour. Genetics, 1915, v, 51.
3. Beaumont, William: Experiments and Observations on the Gastric Juice and the Physiology of Digestion, Edinburgh, 1838, p. 37, footnote by Dr. Combe.
4. Boldyreff: Quart. Jour. Physiol., 1914, viii, 1.
5. Carlson, A. J.: Contributions to the Physiology of the Stomach, XXV, A Note on the Chemistry of Human Gastric Juice, Am. Jour. Physiol., 1915, xxxviii, 248.
6. The Actual Acidity of Human Gastric Juice, editorial, THE JOURNAL A. M. A., Aug. 15, 1914, p. 580.

suggests that it is this mechanism for self-regulation of the acidity of the stomach content which breaks down in cases of so-called hyperacidity in man. He adds that in cases of "hypersecretion" the quantity of juice secreted is greater than normal, and the secretion may persist in the absence of all normal stimuli, but the neutralizing factors suffice to reduce the acidity of the juice approximately to that found in the normal stomach. It is purely a balance of secretion rate and neutralization capacity. It follows that impairment of the neutralization factors or very excessive rate of gastric secretion would tend to render the acidity of the gastric content equal to that of pure gastric juice; in other words, to produce clinical "hyperacidity."

Carlson[5] has also offered a suggestion in partial explanation of the continuous secretion of gastric juice which may be observed. It is well known that products of digestion may act as secretory stimuli. The proteins of pure gastric juice undergo digestion in the stomach cavity. By yielding gastric secretagogues, this autodigestion of the gastric juice itself may be a factor in the continuous secretion of the stomach.

SOME ASPECTS OF LACTATION

Science has often cherished the hope of finding specific stimulants for the individual glands or organ functions. In the days when the now discarded expression "biliousness" was popular, great expectations were awakened by the possibility of finding a cholagogue which might in some way promote the physiologic activities of the liver. Indeed, cholagogic potencies were at one time ascribed to a number of familiar drugs, and actually received the endorsement of serious investigators. It was later demonstrated, however, that the evidence regarding the promoting effect of the selected substances on biliary secretion was either not valid when observations were extended over a sufficiently long period, or they were misleading in that the drug merely produced muscular effects along the biliary tract so that a more immediate discharge of bile simulated an increased secretion in the sense of new production. Thus far, bile alone has proved to be a true cholagogue.

A somewhat analogous experience appears to be in progress in the case of the mammary gland. The possible occurrence of real galactagogues — agents which will promote the production of milk by stimulating its secretion — has long made an appeal both to the dairy farmer and to the physician who is interested in the problem of lactation in women. Not long ago we commented on the recent observations that the extracts of certain glands appear to cause an immediate effect on the flow of milk from lactating animals.[1] The explanation of this peculiar response, which could be provoked by injections of suitable pituitary extracts, for example, was not entirely clear at first, although the observation itself was verified by several competent physiologists and on a variety of animal species. Obviously, if the result is merely a mechanical action giving rise to a sudden discharge of stored milk, its significance would be quite different from that of an action on the secreting mammary cells whereby they are stimulated to augmented activity, as the pancreas is after an injection of secretin into the circulation. Augmented milk production and accelerated discharge of milk are by no means of equal import or necessarily identical.

As the outcome of a series of experiments at the University of Chicago, Gaines[2] has come to the conclusion that the transient outflow of milk after injection of pituitary extracts is not at all due to secretory performance of the gland cells, but can be explained as a muscular phenomenon. The substance causes a muscular constriction of the milk ducts and alveoli, with a consequent expression of the milk present. Accordingly, the temporary flow of milk produced by such injections is entirely dependent on the amount of milk in the gland. The muscular character of the response can be demonstrated on an active mammary gland inflated with air, and even in an excised gland devoid of any circulation. The nonlactating gland, up to a late stage in pregnancy, is not sensitive to the pituitary substance. This difference in the response of the contractile tissue of the mammary gland, according to its stage of functional activity, finds an analogy in the unlike effects of epinephrin on the gravid and virgin uterus, respectively.

An active increase of pressure in the mammary gland closely resembling this effect of the pituitary product is caused by the simple act of nursing. Milking excites a similar reflex contraction of the gland musculature and an expression of milk, though in lesser degree than normal nursing. Of late it has been believed that the removal of milk from the mammary gland goes on quite independent of the nervous system. Gaines, however, has furnished strong presumptive evidence of a reflex, which can be completely inhibited by anesthesia. He believes that the stimulus which naturally excites this conditioned reflex must be found in the friction and sucking movements of the young acting on the cutaneous organs of the teat. The reflex arc is conceived to be dependent at times on the psychic condition of the mother, for the failure of vigorous nursing to secure milk under certain conditions (as in anesthesia or during the absence of the sucklings and consequent maternal concern) indicates that the removal of milk is not purely passive with respect to the activity of the gland. In the animals studied, the return of the young, after separation from

1. Pituitary Extract and Milk Secretion, editorial, THE JOURNAL A. M. A., Dec. 26, 1914, p. 2292.

2. Gaines, W. L.: A Contribution to the Physiology of Lactation, Am. Jour. Physiol., 1915, xxxviii, 285.

the mother, greatly augmented the effect of nursing or milking. It is even reported that with the gland under extreme tension, a contraction of the musculature and an actual ejection of milk in a spurt may follow the signs of maternal concern. It is said that the mother whale ejects milk from her mammary gland into the mouth of the young without the active sucking commonly observed in other mammalian species.

It has been doubted whether the capacity of the ducts and alveoli of the udder is as large as the volume of milk yielded at one time. In the case of the goat, the species particularly studied by Gaines, the indication is that practically the entire quantity of milk obtainable at any one period is present preformed in the udder. There is no reason, he argues, why the milk should not be regarded as being accumulated in the udder during the intervals between milkings, and the milking operation regarded as a more or less effectual method of stimulating a reflex. The latter may thus be conceived to cause a contraction in the gland musculature, resulting in the discharge or ejection of a greater or lesser part of the milk present, according to the effectiveness with which the reflex is excited. The problems of this suggested muscular mechanism, and its location, structure and innervation, are still to be elucidated.

TIME RELATIONS IN METABOLISM

The time relations of metabolism are beginning to arouse the attention of investigators. This is the result of the advance in knowledge of the biologic performances of the organism. In earlier days it represented progress to be able to contrast the beginning and the end results of metabolism; to measure accurately the intake and output of matter and energy, and to account exactly for the expenditures of the organism. This no longer suffices for the properly inquisitive physiologist. He is determined on learning where and how the intermediate stages of nutrition are carried on, so that each step in the fundamental chemical changes in the living body can be followed. The pathology of nutrition has thus gained a broader outlook. In the future, defects of function are to be located more specifically. It will no longer suffice to say that sugar is not burned up in some individual organism, and to designate this with the indefinite label of the diabetic. The deranged organ or the perverted mechanism must be discovered. Only in this broader way is there an opportunity for real therapeutic progress.

Proteins are highly complex substances far removed, in a chemical sense, from the simple end products in the form of which they leave the body. One might reasonably expect, therefore, that the story of this conversion would be a long one and that the time required for the disintegrative changes of protein digestion and metabolism would be correspondingly extended. The series of links in the chain of successive transformations is a long one. Digestion, absorption, transport and location in some tissue or other, synthesis or destruction, removal of the products and return to the blood stream, excretion—every step requires some time.

It has been shown that of the ultimate products of protein digestion—the amino-acids—the simpler representatives, such as glycocoll and alanin, require for their metabolism under optimal conditions a period of about nine hours' duration until the nitrogenous end products are recovered in the urine.[1] This period corresponds in a general way with the time relations for a comparable part of the protein molecule ingested as such.[2] By the use of the drug phlorhizin, which induces a condition of experimental diabetes in animals whereby a large portion of the protein metabolized in the body is excreted in the form of unoxidized sugar, both the nitrogenous and non-nitrogenous metabolic products of proteins and amino-acids can be studied. When protein is fed to a phlorhizinized individual, the urea and the glucose derived are excreted quite promptly.

Data are now available for the rate of metabolism of both proteins and amino-acids fed under the conditions noted. It is likewise known precisely how long a time is required for the reappearance of glucose itself fed to an animal rendered temporarily diabetic with phlorhizin. It appears[3] that the entire series of metabolic changes leading to the synthesis of glucose from amino-acids and its excretion may occupy a period of time only slightly in excess of that necessary for the simple absorption and elimination of the corresponding amount of ingested glucose. Janney[3] has shown essentially the same relations to exist after feeding a variety of typical proteins themselves. It follows, as he points out, that the rate of metabolism of proteins may be practically identical with that of amino-acids. The time required by the organism to effect digestion of the complex protein molecule into amino-acids, and the metabolism of the latter is scarcely longer than that required for the simple process of absorption and elimination of glucose (in the diabetic). This emphasizes the unexpected relative rapidity characteristic of metabolic reactions, for the chemical and physiologic changes involved include the digestion, that is, hydrolysis of protein into complex and simpler polypeptids, their further breakdown into amino-acids, absorption of these products, denitrogenization, the synthesis of glucose and urea, and the final elimination of these end products.

1. Csonka, F. A.: Jour. Biol. Chem., 1915, xx, 539.
2. Janney, N. W.: Jour. Biol. Chem., 1915, xx, 321.
3. Janney, N. W.: A Note on the Rate of Metabolism of Proteins and Amino-Acids, Jour. Biol. Chem., 1915, xxii, 191.

In this connection, it is interesting to compare the time relations of a quite different physiologic process for which figures have recently been supplied from the Department of Physiology at Columbia University.[4] It is now well known that foreign fats, as well as certain fat-soluble substances, such as some of the plant pigments, readily find their way into the secretion of the mammary gland. Bowes[4] fed arachis oil, which contains about 5 per cent. of arachic acid, to a lactating animal, and watched for the appearance of this readily identified substance in the milk. The result demonstrated that the time required for the ingested fatty acids to appear in this way is not over twelve and one-half hours, and probably less.

THE LOSSES OF WEIGHT DURING STARVATION

During starvation, body materials are necessarily used up to supply the energy requisite for the vital functions. Some of the organs, like the heart and the respiratory muscles, are maintained in continued activity independent of the intake of food, while life lasts. The result is well known. The body loses weight during inanition, owing to the consumption of some of its own tissue substances. This process of nutrition at the expense of one's own tissues may go on not alone for days, but even for weeks. Fasts exceeding a month in duration are not at all uncommon in the literature of physiology.[5]

Whether or not all tissues participate to a comparatively equal degree in the depletion brought about by starvation is a question which has long interested investigators. Statistics on the relative losses of weight in the case of different organs were collected more than half a century ago. The brain, heart and respiratory muscles, such as the diaphragm, were found to undergo little loss of weight for a long time. Hence arose the teleologic explanation that those organs which are most necessary for the maintenance of life are protected, as it were, from depletion. It might be assumed that those organs which are most active, and therefore require most energy, would show the greatest loss of weight. But this does not follow in fact. It is true that the nutritive needs of a tissue are determined by its activity; but inasmuch as the circulating fluids offer a common store of energy to be drawn on, the active tissues of the body can easily appropriate the materials set free elsewhere, and maintain their integrity at the expense of other parts.

A tenable explanation[6] of the varying losses of weight in the organs during starvation appears to be offered by the new investigations of Jackson at the University of Minnesota. Actual measurements show that with respect to the relative loss in weight during inanition, the organs may be divided into three groups. In the first group, which includes the suprarenals, thyroid, skeleton, eyeballs, spinal cord and brain, and thymus, there is little, if any, loss in absolute weight during inanition, and a corresponding increase in relative weight. In general, there is a relatively greater loss during chronic inanition, which is especially marked in the case of the thyroid gland. The thymus, having already undergone age involution, is affected only slightly, if at all. In the second group, which includes the kidneys, hypophysis, heart, testes, lungs, musculature and integument, the loss in absolute weight during inanition is more nearly in proportion to that of the whole body, so that their relative weight is usually not greatly changed. In all except the hypophysis, however, the loss is relatively greater during chronic inanition. Especially the lungs, testes, integument and musculature appear to lose markedly during chronic inanition. In the third group, including the spleen, liver and alimentary canal, the loss in absolute weight is relatively much greater than in the body as a whole, so they decrease in relative as well as in absolute weight.

To explain these facts, Jackson inclines to the view of Paschutin, who stated that the various organs lose in proportion to their storage content of available food supply. The various proteins, fats and carbohydrates are dissolved and carried away by the circulation at different times and with different degrees of rapidity. Thus the variability in the loss of weight in different organs and in different types of inanition would be ultimately explained primarily on a chemical basis. In the absence of a food supply, the animal organism deals with the resources of its tissues with an economy referable to the peculiarities of its composition.

4. Bowes, O. C.: The Rate of the Passage of Fatty Acid of Food into the Mammary Glands of the Goat, Jour. Biol. Chem., 1915, xxii, 11.

5. Prolonged Fasting, editorial, THE JOURNAL A. M. A., Sept. 11, 1915, p. 956.

6. Jackson, C. M.: Effects of Acute and Chronic Inanition upon the Relative Weights of the Various Organs and Systems of Adult Albino Rats, Am. Jour. Anat., 1915, xviii, 75.

Current Comment

HEALTH DISTRICTS IN NEW YORK CITY

A pamphlet recently issued by the Department of Health of the City of New York reports an interesting experiment in municipal health administration which has been carried on during the past year. Sept. 30, 1914, the commissioner of health issued an order establishing an experimental health district within which all the functions of the health department were to be locally directed. This district is bounded by Scommel, Division and Clinton streets and the East River, the objects being to try out the plan of local health administration, to avoid the overlapping of different bureaus and departments and to increase the usefulness of the department of health through the establishment of intimate neighborly relations between the department of health and the community. It is obvious that with the

continued growth of our larger cities, the municipal department of health will become as abstract and impersonal an institution as is the state department of health to the majority of the inhabitants of the state. Health District No. 1 is situated in the seventh ward of the lower East Side, in one of the most densely populated districts of New York. The twenty-one city blocks cover approximately 63 acres, with a population of about 35,000. Permanent quarters were secured in which three rooms are used for a milk station. On the walls appear placards and photographs of health exhibits, together with pictures illustrating the work of the street cleaning, tenement house and fire departments. Room has also been provided for afternoon and evening meetings of girls' leagues, boys' health leagues, parents' meetings, etc. Four rooms contain the offices of the district commissioner, the visiting nurses, tenement house inspectors, and others. From this office is carried on the work in the district on infant feeding, preschool and school examinations, midwife and foundling supervision, infectious disease supervision, food inspection and sanitation. The staff consists of a health officer, a medical inspector, one nurse each from the milk station, school group and infectious disease district, one nurse's assistant, one food inspector and one sanitary inspector. Each block in the district is numbered, and for each family an envelope is provided in the office files. These envelopes are grouped by houses and by blocks. A separate record is also kept of each house. Educational pamphlets were distributed to the people of the district by inspectors and officers direct to the patrons of the milk station, to the boys' and girls' leagues and to the parents' conferences. Mothers' meetings are held at the milk station, and talks given by the nurses on the care of the baby. The physicians located in the district have been organized into a local physicians' advisory committee. The various relief societies and the social agencies working in the district have been banded together as a local relief committee. Principals of the public schools, superintendents of hospitals, directors of social organizations and local civic workers have been organized into a general advisory committee. While the report covers only the first six months' work, it has already been demonstrated that the work of the health department has become a concrete matter to the inhabitants of the district. The district office is now recognized as a place where the people can come for guidance on health matters. The district staff has developed an interest in and a knowledge of the individual and in the various health conditions of the community. Many small matters have been adjusted directly at the district office without delay and without burdening the officials of the city health service. The cooperation between physicians and nurses has produced better results, the interest of the people in the exhibits and the literature has been marked, and the local organizations and individuals have been enabled to render much effective aid to the health department in developing a community health program. This most interesting experiment is worthy of the careful study of the health officers of all our larger cities. There is little doubt that, in the development of our great centers of population, much has been lost in the way of personal influence and acquaintanceship. Experimental Health District No. 1 is an effort to bring the public health work of our cities into closer relation and usefulness to the individual.

THE EFFECTS OF INHALATION OF CHLORIN GAS

The use of poisonous gases as a mode of warfare in the present European conflict has been attended with severe physiologic effects on the individuals who have been attacked by them. A few records are available of the responses of the animal organism to very dilute concentrations of chlorin and bromin, but they shed little light on what has lately been observed to occur when soldiers are "gassed" on the battlefield by the vapors of these elements mixed with air. Evidently the concentrations of the noxious gases in the atmosphere under the conditions in which they are employed in attack is greater than is generally encountered under any other likely condition such as might ordinarily arise in industrial works. Sir Edward Schäfer,[1] the Edinburgh physiologist, has demonstrated in a recent experimental investigation of the subject that the result of the inhalation of chlorin gas is always serious. When the content in the respired air is relatively small, no effect may be visible for some minutes, after which time a profound change takes place, sometimes with great suddenness. The conspicuous symptoms of the sudden change include a fall of blood pressure and a slowing or interruption of respiration. On the substitution of air for the gaseous mixture, a recovery may result if the content of chlorin has not been too large. Inasmuch as the inhaled chlorin cannot be carried to the tissues in a free state, the effects mentioned must be due to something happening in the lung. The "vitality" of the tissues is not lost, for the muscles and nerves are still irritable in the usual manner immediately after death, and the heart may also be responsive to appropriate stimuli. The lungs, however, invariably give evidence of the damage done by the inhalation of chlorin. Even after the shortest exposure to a fatal dose, they become intensely red and congested, either all over or in innumerable patches. There is room for considerable speculation as to the varied effects which might be produced locally in the lung by an irritant gas like chlorin. As Schäfer has pointed out, it may directly affect the bronchial musculature or the vascular musculature; it may stimulate the mucus-secreting mechanism of the air tubes; it may influence the coagulability or viscosity of the blood within the pulmonary vessels, or it may produce reflex effects by exciting the endings or afferent nerves within the lungs. Schäfer's own investigations point to the conclusion that chlorin produces its fatal results by causing obstruction of the pulmonary vessels, amounting in some cases to complete stasis, and not by causing contraction of the bronchioles. The pulmonary capillaries are found to be gorged with blood, and there is an extraordinary amount of edema in the interstitial tissue of the lung.

1. Schäfer, Edward: On the Immediate Effects of the Inhalation of Chlorine Gas, Brit. Med. Jour., Aug. 14, 1915, p. 245.

The edema is presumably secondary to the vascular obstruction. Apart from this, the tissues of the lung in cases of death by chlorin gas inhalation are normal, the epithelium cells of the bronchial tubes being well preserved, and little increase of mucus being evident. Information regarding the effects of inhalation of bromin vapor is still rather scanty. It appears, however, from Schäfer's statements, that although much more irritating to the conjunctival mucous membrane, bromin is less deleterious to the respiratory organs than chlorin, the fulminating effect of which appears to be absent in the case of bromin.

EMOTIONS AS CAUSES OF ORGANIC DISEASE

Skeptics have not been wanting who doubt the alleged influence of the mind on the physical organism, partly because of a materialistic philosophy dominant in scientific circles, but chiefly because of the difficulty of understanding how such influences could produce permanent bodily changes. Evidence to satisfy all the canons of inductive logic is now available not only to prove conclusively that emotions may operate in such a way as to cause organic as well as functional diseases, but also to show the exact mechanism by which the sympathetic nervous system, cooperating with certain of the ductless glands, may produce pathologic conditions. Naunyn reported a case of diabetes mellitus, the cause of which was an emotional shock. The Allen treatment of pancreatic diabetes, by means of starvation, recognizes the possibility of a "functional" disturbance of the pancreas, which may disappear with rest. Osler cites violent emotion, such as fright, in his account of the etiology of diabetes insipidus. Diseases of the skin, as alopecia areata, may have an emotional origin. The mechanism by which such profound organic disturbances are brought about is the autonomic nervous system. The rôle of this system in producing emotions has been studied over a period of years by Cannon and his pupils.[1] Beginning with the well-known fact that the autonomic nervous system takes its origin from the cranial-cervical, thoracic-lumbar and sacral regions of the cerebrospinal axis, Cannon attempts to correlate the activity of these portions of the system with three distinct types of emotions. Furher, he points out as a result of physiologic experiment that whenever the innervation from the thoracic-lumbar (sympathetic) portion of the system meets, in a viscus, the innervation from either the cranial-cervical or the sacral portion, there is always an opposition of the effects produced. In the eye, the contraction of the pupil is due to impulses received from the cranial autonomic, while the dilation of the pupil is effected by nerve fibers which come from the thoracic portion of the sympathetic. Again, the secretory and tonic motor innervation of the stomach come through the vagus nerve from sympathetic neurons which have their origin in the cervical division of that system. Stimulation of the splanchnic nerves causes an inhibition of both the secretory and motor functions of the stomach. The viscera of the pelvis are likewise doubly innervated. The autonomic neurons from the thoracic-lumbar segment cause relaxation of the lower end of the intestine. The sacral autonomic fibers for the same organ cause contraction. The bladder and reproductive organs are similarly innervated. Corresponding to the three parts of the autonomic system and the organs associated with them, there are three types of emotional response. The cranial portion of the system, by regulating the secretion and motion of the digestive organs, is concerned with building up the reserves of bodily strength. The emotions correlated with these physiologic activities are bodily satisfaction and well being. The sympathetic system is concerned especially with the functions of the suprarenal gland. The physiologic effects of the secretion of this gland are identical with the effects of stimulating the thoracic-lumbar sympathetic system: the pupil is dilated, the heart is accelerated, the functions of the stomach are inhibited, and the glands of the skin and the erector muscles of the hair are excited. Glycogen in the liver is liberated in the form of dextrose, with the result that sugar is available for muscles. The emotions which call for a sudden summoning of muscular energy are rage and fear, since correlated with them are the instincts of fighting and flight. The functions of the pelvic viscera are mainly in the nature of emptying accumulated secretions. The emotions depending on these functions are those of satiety and repletion. The conclusion is then evident that emotions may cause all of the changes which are produced by the autonomic system. The vascular changes thus produced have long been known, but the intimate relation between the suprarenal gland and this system has only recently been demonstrated. The case for emotional etiology of some diseases is thereby greatly strengthened.

1. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear and Rage, an Account of Recent Researches into the Function of Emotional Excitement, New York, Daniel Appleton & Co., 1915.

A METHOD OF ATTACK ON POVERTY AND TUBERCULOSIS

The New York Association for Improving the Condition of the Poor has just published a report on the results of the first two years of its Home Hospital experiment. The methods adopted in this experiment were described in THE JOURNAL last year.[1] It is based on a recognition of the fact that tuberculosis is not merely a human disease but also a social disorder. The problem among the tenement poor is often that of loss of self-respect and standards of living in the family, as well as loss of health in the tuberculous member. The association has found that by transplanting the whole family to suitable surroundings under adequate supervision, it is possible to preserve the family unit, and in some cases to rehabilitate it physically, socially and economically, while caring for the tuberculous patient. Many patients in the early stages of tuberculosis have been cured, while improved health and earning capacity have been attained for others whose cases were moderately advanced. Meanwhile, the well members of the family, especially the

1. A Hopeful Experiment in the Treatment of Tuberculosis, Miscellany, THE JOURNAL A. M. A., March 28, 1914, p. 1043.

children, have been protected from infection, and their physical condition improved. The family's total earning capacity has also been increased and its standards raised. The cost of this combined social and physical treatment of the whole problem has been found less than that of sending the breadwinner or homemaker to a hospital and either placing the dependents in institutions or supplying necessary relief at home. The Home Hospital plan, moreover, has a profound advantage over the other method in that the whole family is being taught proper habits and helped back to a normal self-supporting existence while the disease is being treated in one or more of its members. The hospital now has, on an average, about 130 patients and over 200 inmates. The demand for its services is so great that the intention is to make it permanent and to increase its size. The association disclaims any intention to supplant other much-needed agencies already in the field. The success of the Home Hospital experiment, however, must inevitably suggest the question whether it is not possible that in our tuberculosis campaign we have directed our attack too exclusively toward the disease as it exists in the individual. If tuberculosis is a social disorder, before we can hope to exterminate it, we must strike at its social roots.

THE WAR AND MEDICAL EDUCATION IN ENGLAND

According to the *British Medical Journal* there has been a decided falling off this year in the number of young men entering on the study of medicine. The number of medical students entering Cambridge is 41, as compared with 64 last year and 116 in 1913. There has also been a general falling off of students entering the medical schools in London. At St. Thomas Hospital, the entry is only about 45 per cent. of the average. At St. Mary's Hospital the attendance of students is about 23 per cent. of the average for the three years prior to 1913. At King's College Hospital Medical School the attendance is only 11 per cent. of the average; at Guy's Hospital it is only 10 per cent. of the average, and at St. Bartholomew's Hospital, only 2 per cent. At University College Hospital Medical School the entry is only a little below the normal; while at the London Hospital Medical School the entry is only 5 per cent. below the normal, and is actually larger than in 1913. Even with the reduced attendance as just indicated, it is believed that the number will be still further greatly reduced, since many of the students who have entered this year, it is expected, will shortly enlist in the army. The entry for special postgraduate classes has likewise declined, the reduction being 62 per cent., as compared with the average figures for the three years before the war. In contrast to the reduction in the number of male medical students, the enrolment at the London School of Medicine for Women has increased, 110 having entered this fall, as compared with sixty-nine last year and an average of forty-four in the three years preceding the war.

A NAUSEATING PUBLICITY

Sensational medical articles in newspapers have become a common, every-day occurrence. Pathology is now a breakfast table topic and the science of eugenics agitates the fluttering breasts of stately matrons and young débutantes at afternoon teas. The most recent sensation concerns the action of a Chicago physician regarding an infant marred by various anomalies of development. The newspapers featured the case; they elaborated it with gossip and discussion; with opinions from physicians; with the statements of social workers and psychologists; with letters of mothers and even of crippled and imbecile children. And the end is not yet. One newspaper publishes an autobiography of the physician, who promises to write, in serial form, the story of the case. The whole incident is nauseating. Infants with similar anomalies are born almost daily; no two cases are exactly alike; each is a problem unto itself. In this instance, apparently, the rights of the individual have been flippantly considered and the sacredness of the home has been ruthlessly bandied in public. Nothing has been nor can anything ever be gained by such disgusting discussion as has accompanied this particular incident. One person has been basking in the limelight of publicity, but in this instance it is not the brightness of the spotlight but a yellow sickly flame.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Drug Addict Attacks Physician.—A cocain addict of Galesburg entered the office of Dr. George D. Prewett, Peoria, November 5, and demanded cocain, and when refused attempted violence.

Personal.—Dr. John H. Riley, DeKalb, who has been ill for several weeks, is now reported to be improving.——Prof. Oliver H. Moore of the University of Illinois, who has recently returned from the war zone, gave a talk before the Y. W. C. A. at Champaign, November 15, in which he related his experiences with the Red Cross in France.——Dr. Warren R. Rainey, Salem, who is on duty in France, writes that he and Mrs. Rainey expect to return home before Christmas.——Dr. Oscar B. Stafford, La Salle, was seriously injured in a collision between his buggy and an automobile, November 10.——Dr. William G. Bechtold, Breese, who has been seriously ill with tetanus, is reported to be convalescent.

Chicago

Fresh-Air Cars.—Sixty surface street cars, five operated on each of twelve lines, were placed in service, November 21, as fresh-air cars. Each car had its windows and doors open and bore signs "Fresh-Air Car." The company announces that the experiment will be continued indefinitely. It is too early yet to determine whether or not it will be a success.

Diphtheria Carriers.—During October, 15,234 throat cultures from children were examined by the laboratory of the Department of Health. Of these, 656 were found to be carriers of the diphtheria bacillus, which means that they were innocent sources of danger to other children with whom they came in contact. According to the bulletin of the Health Department, 22,572 diphtheria specimens were examined during the month. This number included 7,338 specimens from known cases of diphtheria. The figures show that twenty-five suspected cultures were examined for each posi-

tive case found. The bulletin says that this might seem to be a small percentage of positive cases, but, when it is considered that over 600 children were potential distributors of this disease, the importance of these examinations will be realized, as it has long been known that the diphtheria carrier is the most prolific source of the spread of the disease.

The Case of the Bollinger Baby.—During the last few days the newspapers have been publishing more or less sensational statements regarding the case of a child born defective who was, it is alleged, allowed to die, when an operation might have saved its life.

The essential malformations of the body, as disclosed by the records of the coroner's office, were as follows:

Imperforate anus; fusion of the two kidneys into one, located on the left side and with a single ureter; absence of the right external ear and of the external auditory canal; a defective development of the skin over the shoulders, especially the right, causing an apparent shortening of the neck; absence of all or part of the coccyx and absence of the right testicle.

The acquired pathological conditions were: Small extradural hemorrhages in the spinal canal; small subpleural hemorrhages; a discharge from the nose, and the Coroner's physician reports an area of hemorrhage in the pia-mater in the left Sylvian fissure.

INDIANA

Tuberculosis Hospitals.—Two tuberculosis hospitals are being constructed for Blackford County by the Red Cross Society, one in Montpelier and the other at Hartford City.

Whiting Physicians Organize.—Physicians of Whiting met at the office of Dr. George H. Hoskins, November 7, and organized the Physicians' Club of Whiting, electing Dr. George H. Hoskins, president; and Dr. Chauncey M. Gillespie, secretary-treasurer.

Epidemic of Gastro-Intestinal Disorder.—More than 1,000 cases of some form of gastro-intestinal trouble occurred in the northern part of Indianapolis last week. Dr. Herman G. Morgan, sanitarian, after eliminating all other causes but that of water supply, has concluded that it is due to either bacteria or chemicals in the water. Boiling the water has prevented a spread of the infection.

Personal.—Dr. Frederick N. Wright, Hazelwood, while hunting near Hazelwood, was injured by the accidental discharge of his shotgun and may lose his right foot.——The house of Dr. George W. Grossnickle, Elkhart, was damaged by fire to the extent of $600, November 14.——Dr. Thomas B. Eastman, a member of the Indianapolis Board of Health, has been selected as a representative of that body on the advisory board which will consider the affairs of the city dispensary which has again been placed under the management of the Indiana University School of Medicine.

MARYLAND

Hospital News.—The new Emergency Hospital Building, Easton, was formally dedicated, November 23.

Leaves Large Estate.—Dr. Edmund C. Rivers, Baltimore, who was drowned October 24, left an estate valued at $170,000.

Hospital Wins Suit.—The Sheppard and Enoch Pratt Hospital was successful in a suit against Baltimore city in regard to damage and assessment of benefits on property of the trustees condemned in the construction of the Key Hyway. The hospital was finally awarded $1,705.

Physician Gives Travelogue Lecture.—Dr. Henry O. Reik, secretary of the board of managers of the Baltimore Eye, Ear and Throat Charity Hospital, is delivering a series of four travelogue lectures, illustrated by autochrome photographs. The subject of the first lecture was "The Great Southwest and the Grand Canyon."

Neurologists Organize.—The Baltimore Neurological Society was recently organized with a charter membership of seven. Dr. Charles M. Byrnes was elected president, and Dr. Daniel D. V. Stuart, Jr., secretary-treasurer. One of the requirements for membership is that the applicant shall have published at least one contribution to neurologic study.

Physicians Organize.—The Physicians' Civic Club was organized at a meeting of physicians at the Medical and Chirurgical Faculty Building, November 11, with a charter membership of 100. Dr. William T. Watson was elected president; Dr. Nathan R. Gorter, vice president, and Dr. Walter D. Wise, secretary-treasurer. Mr. Frederick C. Howe, commissioner of immigration of New York, delivered an address before the college on "An American City; Its

Pasteur Institute to Close.—The Pasteur Institute at Mercy Hospital, Baltimore, is to be discontinued after the two patients now under treatment are discharged. This decision was made on account of the recent reduction in the number of patients, the lack of work, the excess of expenses over income, and because the United States Public Health Service furnishes to reputable physicians, free of charge, the antirabic serum. Nearly 2,000 cases of hydrophobia had been treated in the hospital since the institution became associated with it.

Personal.—Dr. F. Janney Smith, chief resident physician at Johns Hopkins Hospital, Baltimore, has been appointed resident physician to Ford Hospital, Detroit.——Dr. Ralph B. Seem has been appointed first assistant superintendent to Johns Hopkins Hospital, succeeding Dr. Karl H. VanNorman, resigned.——Dr. Lewis A. Sexton has been promoted from admitting physician to the directorship of the dispensary of Johns Hopkins Hospital.——Dr. Leonard G. Rowntree, assistant head of the department of medicine of Johns Hopkins University, has been appointed professor of medicine and chief of the medical department of the University of Minnesota.——Dr. David M. R. Culbreth, Baltimore, has been elected vice president of the Caroline County chapter of the Eastern Shore Society of Baltimore.

MICHIGAN

The Ranney Bequest.—By the will of the late Dr. George E. Ranney, Lansing, a 20-acre tract is bequeathed as a memorial playground for the city.

Personal.—Dr. Abner Hayward, Mt. Clemens, is reported to be critically ill as the result of a cerebral hemorrhage.——Dr. James G. Cumming, Ann Arbor, has been appointed chief of the bureau of communicable diseases of the State Board of Health of California.

MISSOURI

Purchasable Factors in Public Health.—Dr. Allen W. Freeman, epidemiologist to the United States Public Health Service, delivered an address at the luncheon of the Commerce Club, St. Joseph, November 1, on "Purchasable Factors in Public Health."

Diphtheria Epidemic in Lamar.—On November 11 the Lamar City Board of Health issued orders closing all opera houses, picture shows and other public entertainments and all churches and meetings to children of 15 years of age and under, on account of the epidemic of diphtheria which prevails in the city. The lower grades of the city schools were ordered closed by the board of education until November 15.

Kansas City School Physicians Named.—Dr. Paul Paquin, health director of Kansas City, has appointed twenty-nine physicians as medical inspectors of schools. The examiners will serve gratuitously. They will be given police power as sanitary inspectors, receiving free street car transportation, will examine children in each school at least once a week and will inspect school hospitals and grounds and report insanitary conditions to the health department.

Personal.—Dr. J. Elliott Royer, Kansas City, has returned after two years postgraduate study in Europe, the last twelve months of which has been spent as volunteer special neurologist in British military hospitals.——Dr. John N. Baskett, Hannibal, was operated on in St. Louis, recently, for the removal of gallstones.——Dr. Luther A. Todd has resigned as president of the St. Joseph Board of Health.——Dr. Frank R. Morley, Sedalia, is reported to be critically ill with septicemia.——Dr. John P. Ralston, Springfield, suffered a second cerebral hemorrhage, October 25, and is reported to be in a serious condition.

St. Louis

Social Service Lecture.—Dr. Walter Fischel on October 25 delivered the third lecture in the course being given by members of the faculty of Washington University, under the auspices of the Department of Nursing and Social Service. The subject of his lecture was "Tuberculosis and Its Significance on the Social Problem."

Federal Sanitation Bureau in St. Louis.—St. Louis is to be district headquarters for the federal government's rural sanitation work. Surg. Mark J. White, U. S. P. H. S., now in charge of the St. Louis Marine Hospital, will supervise this work for the time being. Ten or more rooms in the Marine Hospital building will be refitted for the purpose and from ten to twelve chemists of the department will be sent from St. Louis to work in this field.

Washington University Appointments.—Washington University announced the appointment of Dr. Leo Loeb to the newly established chair of comparative pathology in the medical school; Dr. Philip A. Shaffer, Ph.D., has been appointed dean to date from June 3, 1915; Dr. Borden S. Veeder, has been promoted to assistant professor of pediatrics; Dr. Robert A. Gazell to associate in physiology and Dr. Philip C. Jeans to instructor in pediatrics.

Personal.—Dr. John A. Pringle, acting assistant superintendent of the City Hospital, is said to have made the highest grade in proficiency in the recent efficiency examination for superintendent of the institution; Dr. James Lewald stood second on the list and Dr. Eugene A. Scharff, third.——Dr. Frederick A. Baldwin, city bacteriologist, is suffering from a streptococcus infection of the right hand.——Dr. Ralph L. Thompson, recently returned from service on the western war front, delivered an address before the City Club, November 6. He also spoke before the members of the various alumni associations of the university.

MONTANA

Deaconess Hospital.—An active campaign is being carried on in Miles City to raise $30,000 for the construction of a Deaconess Hospital.

Sanitary Surveys Completed.—Inspectors connected with the State Board of Health have completed sanitary surveys of the water systems of Great Falls and Helena.

Professional Building in Bozeman.—Physicians, dentists and lawyers of Bozeman have united in the erection of a professional building, which will contain offices for members of the three professions.

Personal.—Dr. John W. Frizzell, Great Falls, fractured his leg while cranking his car recently.——Dr. Thomas E. Murray, Great Falls, will spend a year in Arizona and Florida.——Dr. George H. Putney, Carter, suffered a Colles fracture while cranking his automobile recently.——Dr. William G. MacDonald, Stockett, left for Europe, November 18, where he will serve with the royal army corps.——Drs. William H. Buskirk, Miles City, and Marcus H. Heldman, Ismay, will spend a year in the East in postgraduate work.

NEBRASKA

State Hospital Foundation to be Laid.—Foundations for the State Hospital of the Medical College of the University of Nebraska, Omaha, will be laid this winter. The hospital will be four stories in height with three story wings and will have six wards with accommodations for 116 beds and twelve private rooms.

NEW JERSEY

Dinner to Health Officer.—A testimonial dinner was given to former Health Officer David D. Chandler of Newark by about 200 of his friends, October 26.

Contract for Tuberculosis Building Awarded.—A contract has been awarded for the construction of a tuberculosis building for the New Jersey State Institution for Feeble-Minded Women, Vineland. The stipulated cost was $3,290.

Physicians' Club Organized.—The Physicians' Club of the city of Passaic was formally organized October 27. Dr. John N. Ryan was elected president; Dr. Abraham Machlin, vice president; Dr. Gerard J. Van Schott, Jr., secretary, and Dr. Cornelius Van Der Clock, treasurer.

Must Report Tuberculosis.—Dr. Charles V. Craster, health officer of Newark, has issued a circular to the physicians of Newark calling attention to the requirements of the tuberculosis law of the state, which he says is being continuously violated. The law requires that every case of tuberculosis, as well as any other case of contagious or communicable disease, be reported to the local board of health within forty-eight hours. Physicians have been in the habit of not reporting tuberculosis. The penalty for violation of the law is a fine of from $10 to $500.

Personal.—Dr. Charles Van Kopper, Great Notch, was seriously injured in a collison between automobile buses, November 12.——Dr. Jacob C. Price, Branchville, has been selected as director of the bureau of administration of the State Department of Health; Dr. Millard Knowlton, Trenton, chief of the division of publicity including the subdivision of child hygiene; and Dr. A. Clark Hunt, Metuchen, chief of the division of medical diagnosis, including contagious diseases.——Dr. Britton D. Evans, Greystone Park, medical director of the Morris Plains State Hospital, has been appointed chairman of the committee to prepare legislation for the better care of the insane of the state.——Dr. Charles E. MacDonald, Salem, has returned after several months' service in a war hospital in Budapest, Hungary.——Dr. Arthur J. Casselman, Camden, sailed for Europe, October 24, to become chief bacteriologist of the Women's American War Hospital, Paignton, North Devon, England.

NEW YORK

Personal.—Dr. William H. Heath, Buffalo, has been appointed executive medical advisor and sanitarian to the king of Siam. His duty will be to establish modern sanitary conditions in that country.——Dr. R. Leighton Leak, Syracuse, has been appointed physician in charge of the Syracuse Psychopathic Hospital, succeeding Dr. Hersey G. Locke, resigned.

Rabies.—During the year ended November 1, dogs bit 3,107 persons in New York City, requiring these persons to take the Pasteur antirabic treatment. It is said that the muzzling ordinance is ineffective, and that 354 of the dogs that bit were on the leash and 567 were muzzled. In all instances in which the muzzled dog bit, the muzzle was of the strap variety.

State Investigation of Anthrax Fatalities.—The recent death of Siphia Rosen from anthrax attributed to infection from a fur collar has led to an investigation by the state. Dr. T. C. Graham Rogers, director of the division of industrial hygiene of the state department of labor, is giving the matter his personal attention and proposes to make a thorough investigation of the method of curing and manufacturing cheap furs in this city. Both Dr. Rogers and Dr. Alva H. Doty have expressed the opinion that there need be no alarm felt that the disease would spread.

Tuberculosis Hospitals.—Plans are being made by the board of supervisors of Herkimer County for the County Tuberculosis Sanatorium for which an appropriation of $25,000 was voted at the last election.——At the election in Niagara County, November 2, the tuberculosis hospital referendum was carried by a safe plurality.——The supervisors of Chautauqua County have accepted the gift of a hospital for tuberculosis to be erected on a site purchased by the trustees, under the will of Elizabeth N. Newton, Fredonia, who left a bequest of $150,000 for that purpose.

The Infant Welfare Campaign of 1915.—Official statistics with reference to infant mortality are now available for the first seven months of 1915. They demonstrate the success of the campaign against infant mortality that has been prosecuted with such vigor since the spring of 1914. The infant mortality rate from Jan. 1 to Aug. 1, 1913, was 111 per 1,000 living births; for the same period of 1914 it was 102 per 1,000, and this year the rate has fallen to 98 per 1,000. Two exhibits were in constant use throughout the state and the newspapers have accorded the work generous support. By the aid of these instrumentalities the workers have been enabled to increase the number of infant welfare stations from thirty-two in twelve different localities in 1913 to seventy-four in forty-five cities and towns during the present year. The statistics have demonstrated the utility of these stations in every locality in which they have been established. Efforts have also been made to establish little mothers' leagues in the public and parochial schools and thus far about 12,000 children have been enrolled. Sunday, June 20, was generally observed throughout the state as Child Welfare Day and it is hoped that this may become a permanent feature and be generally observed in succeeding years.

New York City

Health Department Official Dies.—Bayard Clark Fuller, formerly chief inspector for the department of health, died November 10. Mr. Fuller had been in the service of the department for twenty years.

Harvey Society Lectures.—The third lecture of the Harvey Society lecture series, delivered before the New York Academy of Medicine, October 27, was by Dr. Eugene DuBois, Cornell University, on "The Respiration Calorimeter in Clinical Medicine."

Diagnostic Clinic for the Bronx.—The Department of Health has established a Wassermann diagnostic clinic at its Bronx office, Third Avenue and St. Paul's Place. Physicians who desire to avail themselves of the services thus offered are urged to refer their cases to this office.

Court Enforces Medical Treatment of Child.—The authority of the board of education to compel parents to send their children to school in good physical condition has been sus-

tained by the children's court of Brooklyn, which ordered the parents of a pupil to have the boy's diseased tonsils removed.

Personal.—Dr. Wesley M. Baldwin has accepted the appointment of professor of anatomy at the Albany Medical College.——Dr. Charles V. Morrill has been appointed instructor in anatomy and Dr. Robert Chambers assistant in anatomy, to succeed Dr. Baldwin at the Cornell University Medical College.

Lectures for Health Board Employees.—A course of lectures on the "Haunts and Habits of Microbes" will be given to the employees of the Health Department on alternate Saturday afternoons, beginning November 20, and continuing until May. The lectures are under the direction of Dr. William H. Park, and will be given at the laboratory of Bellevue Hospital Medical College.

Suit Against Rockefeller Institute Fails.—The damage suit against Rockefeller Institute for $200,000, brought by two of the former employees of the institute, was dismissed in the United States district court, November 4. The plaintiffs in the case alleged that the doctors had persuaded them to submit to the injection of serum from which they had become infected with an incurable disease. The court held that the facts were insufficient to constitute a cause of action.

Homes for the Aged Investigated.—During the past summer the Department of Health, through its division of inspection, made a survey of forty-six institutions devoted exclusively to the care of the aged, for the purpose of determining the adequacy and suitability of the provisions made for old people in the various homes throughout the city. The report shows that in not a single instance was anything found concerning which serious complaint could justifiably be made. The buildings were all found to be ample in size, and the ventilation, lighting, heating, plumbing and sewage satisfactory. The buildings were all well equipped and the housekeeping invariably well done. There were excellent accommodations for the sick. There were a few minor suggestions made, among them that in several instances a more thorough screening against flies would add to the comfort of the inmates.

Medical College Reorganises Surgical Staff.—Cornell University Medical College has recently reorganized its surgical service at Bellevue Hospital. There is now one visiting surgeon in charge with continuous service; two visiting surgeons with continuous service limited to some special subdivision of general surgery; two associate visiting surgeons on a full-time salary basis with four assistants who will also be juniors to the outpatient department. The organization now includes laboratories for surgical pathology and experimental surgery each under a full-time salaried man. These laboratories are available to all members of the staff who have the privilege of working therein. The entire staff has been appointed to positions on the department of surgery in the medical college. All students take a portion of their ward work in this organization. The essential changes from the system formerly in vogue consists in having one head, continuous service, full-time salaried surgeons and laboratories under the jurisdiction of the surgical service. The staff as at present constituted is as follows: visiting surgeon in charge—Dr. John A. Hartwell, assistant professor of surgery; visiting surgeons—Drs. George Woolsey and John Rogers, professors of clinical surgery; associate surgeons—Drs. Kenneth Bulkley and James N. Worcester, instructors in clinical surgery; junior surgeon—Dr. Fenwick Beekman, instructor in operative surgery; surgical pathologist—Benjamin M. Vance, instructor in pathology, and assistant in experimental pathology—Dr. Joseph W. McMeans, assistant in surgery.

OHIO

Youngstown Pulpits Filled by Physicians.—November 28, through the efforts of the Mahoning County Medical Society, the pulpits of Youngstown were filled by physicians who delivered addresses on health and sanitation.

Personal.—Dr. E. Sheldrick, Cleveland, while motoring near Hagerstown, was seriously injured November 2, by the overturning of his automobile.——Dr. Elmer W. Coe, Youngstown, is ill with smallpox.——Dr. W. R. Moore, Mt. Pleasant, has been appointed assistant medical examiner on the State Industrial Commission.——Dr. William Scott, Loveland, underwent an operation, November 2.

District Tuberculosis Hospital.—At a meeting of the trustees of the District Tuberculosis Hospital held in Chillicothe, November 11, it was decided to erect an administration building to cost $35,000. The funds will be furnished by the counties in the district, each county paying a proportionate share on the basis of its tax duplicates, which will be turned over to the trustees by the first of the year.

Hydrophobia.—According to figures of State Board of Health, since January, 1915, the laboratory examined 189 brains of animals suspected of having rabies, and the Board of Health of Cincinnati examined twenty-four additional. In 115 of the state and fourteen of the Cincinnati examinations the disease was found, showing that the rabies is widespread in Ohio. Five cases in human beings were reported during the year, all of which were fatal.

Hospital News.—The physicians of Bellaire and trustees of the City Hospital held a conference, November 12, on the question of equipment. An offer has been made by a friend of the institution to donate $3,000 to the hospital fund on condition that the trustees raise an additional $10,000. Of this amount, $6,000 had already been subscribed at the time of the meeting.——A Roentgen-ray machine to cost about $3,000 has been installed in the East Liverpool City Hospital. Dr. Joseph W. Chetwynd has been appointed roentgenologist to the institution.

Cincinnati

Work on School to Begin in April.—Dr. Christian R. Holmes, dean of the medical department of the University of Cincinnati, announces that it is expected that the work of construction on the new medical school will begin in April next. The site for the college building is now being graded and a revision of the building plans is being made.

Personal.—Drs. Guy G. Giffen and Giles A. DeCoursey have been appointed junior surgeons on the genito-urinary staff of the Cincinnati Hospital.——Dr. Max W. Shaweker has succeeded Dr. Philip Coulter as assistant receiving surgeon of the Cincinnati General Hospital. Dr. Coulter has been appointed to a position in the United States Public Health Service and will take part in the campaign against trachoma in Virginia.——Dr. Erie A. Fennell has resigned as resident physician of the City Infirmary and the two refuge farms.

Warning to Physicians.—The *Weekly Bulletin* of the Cincinnati Academy of Medicine warns local practitioners against a young German who has been visiting the members of the profession in Cincinnati who have German names, claiming that he bears the same name and obtaining small sums of money from them on the pretense that he is an interned sailor and wishes to enlist in the United States Navy.

PENNSYLVANIA

Personal.—Dr. Frank V. McConkey, York, who underwent operation for appendicitis, recently, is reported to be convalescent.——Dr. Albert A. Lindabury, Scranton, is reported to be seriously ill and is under treatment at the Scranton State Hospital.——Dr. James R. Montgomery, Bloomsburg, while making a professional call in the country, suffered a fracture of the arm by the overturning of his automobile.

Philadelphia

Rush Society Lecture.—The twelfth Rush Society lecture will be delivered at the College of Physicians, November 29, by Dr. Daniel J. McCarthy of the University of Pennsylvania Medical School, on "Medical and Surgical Problems Incident to War."

Women Physicians to Lecture.—Drs. Clara Marshall and Martha Tracy and Miss Mary Ingham have been appointed a committee to arrange for a course in preventive medicine and hygiene to be given to mothers and women generally by the Women's Medical College of Pennsylvania.

Civil Service Examinations.—Notice is given by the Philadelphia Civil Service Commission of the following examinations: December 15, chief of the Division of Vital Statistics with a salary of $1,750 under the Health and Charities Department of the Bureau of Health; January 18, resident physician, open to residents of Pennsylvania with a salary of $600 to $900 under the Department of Health and Charities under the Bureau of Health and Charities; January 19, assistant bacteriologist, first assistant bacteriologist and fourth assistant bacteriologist with respective salaries of $1,400 to $1,500; $2,000 and $1,000, under the Department of Health and Charities of the Bureau of Health; January 13, assistant, pathologic and bacteriologic laboratory, with a salary of $720, under the Department of Health and Charities of the Bureau of Charities; December 10, assistant, antitoxin laboratory, men and women, with a salary of $1,000, under the Department of Health and Charities of the Bureau of Health;

December 27, assistant bacteriologist with a salary of $1,200, under the Department of Public Works of the Water Bureau. Applications for these positions must be executed and filed with the commission not later than the third day prior to and exclusive of the day of the examination.

SOUTH DAKOTA

Off for the War.—Dr. Ole W. Rood, Watertown, has started for Paris, where he will enter a French military hospital.——Dr. Alexander O. Fasser, Bellefourche, has started for France, where he will serve in an American hospital in the war zone.

Removal of a Smallpox Patient.—The supreme court of South Dakota has decided in the case of Gould, appellant, vs. Dr. William F. Keller, Sioux Falls, officer of the board of health in Minnehaha County, that a health officer or physician cannot be compelled to remove a smallpox patient, or other such dangerous patient, from a residence, when there is no pest house or place provided by the city for the detention of such patients. In Sioux Falls a patient had smallpox in a private house and the owner, Gould, tried to compel the board of health to remove the patient. As the city had no pest house, there was nothing to do but leave the patient in the house where the illness occurred. The trial court refused under the circumstances to issue a writ to remove the patient.

CANADA

Hospital News.—Upper Lodge, the beautiful royal domain at Bushey Park, Surrey, has been offered by the king to the Canadian Red Cross. The offer has been accepted by Surg.-Gen. Carleton Jones, on behalf of the Canadian Army Medical Service. It will be furnished and equipped as a convalescent home under Col. Charles A. Hodgetts. It will be known as the Princess Mary's Canadian Red Cross Convalescent Home and will be equipped with 300 beds.——The Carleton County Protestant General Hospital, Ottawa, Ont., held its annual general meeting October 14. The year has been successful and the finance committee was enabled to reduce the overdraft by $2,500. The number of patients admited during the year was 2,743, including a number of soldiers.——The new civic hospital for infectious diseases in Quebec was opened September 30. The hospital will be under the supervision of the sisters of the gray nunnery.——Stratford, Ont., will vote on a bylaw January 1 to provide for $7,500 to wipe out the debt of their city hospital.——The old Bishop Strachan School on College Street, Toronto, will soon be in operation as the first convalescent home for returned wounded soldiers. When completed it will accommodate 200.——The public institutions, including hospitals for the insane and others, in Ontario, have contributed a large proportion of the equipment for the new Ontario Military Hospital being established in Orpington, Kent, England.

Personal.—Lieut. James W. Richardson, M.D., Calgary, Alta., operating specialist in the Imperial Army Medical Corps, is in Canada on furlough after a year's service.——Lieut. Ramsay D. Rakin, Stratford, Ont., is medical officer to the Perth County, Ontario, Battalion Staff.——Dr. Daniel Phelan, surgeon to the Kingston, Ont., penitentiary for nineteen years has retired.——Dr. Benjamin J. McConnell, Winnipeg, Man., has been appointed coroner for that city.——Dr. Weston W. Milburn, Macleod, Alta., has been appointed surgeon for the Blood Reserve in succession to the late Dr. Oliver C. Edwards.——Dr. John Cameron, Middlesex Hospital, London, Eng., has been appointed to the chair of anatomy in Dalhousie University, Halifax, N. S., in succession to the late Dr. Andrew W. H. Lindsay.——Dr. Oliver R. Mabee, Toronto, has been appointed acting professor of pathology in the University of Toronto, pending the return of Prof. John J. Mackenzie, Toronto, whose leave of absence has been extended.——Maj. George H. Burnham, Toronto, has been mentioned for distinguished conduct in the field.——Maj. R. Percy Wright, Montreal, has been appointed officer in command of No. 1 Field Ambulance in succession to Lieut.-Col. Arthur E. Ross, Kingston, Ont., who is now assistant director of medical services of the first Canadian division.——Dr. Henry H. Planche, A.M.C., Cookshire, Que., is on active service at the Dardanelles.——Dr. Howard Hepburn, one-time medical superintendent of the General Hospital, Montreal, is serving on the staff of one of the British field hospitals.——Dr. Harold Tait, R.A.M.C., St. John's, N. F., is on the staff of a base hospital of 3,000 beds in Malta.——Maj. L. Handford McKee, Montreal, has been invalided to England from the Dardanelles.——Capt. William J. Enright, Twenty-Second Battalion, of Port Daniel East, Que., is reported wounded.

Ontario Medical Commission.—The past week has been an important one before the Ontario Medical Commission. The Academy of Medicine, Toronto, presented the case for the medical practitioners from various standpoints, the president of the academy, Dr. William H. B. Aikins, being in charge. Dr. Arthur Jukes Johnson, chief coroner for Toronto, presented the medicolegal aspect of medical practice and cited concrete cases in support of his views. Dr. Albert A. Macdonald, Toronto, spoke for the life insurance companies and also cited cases supporting his claim that the public interested in their policies should be protected by the law. Dr. D. J. Gibbs Wishart said that specialists after graduation should take from two to five years special training before becoming specialists in any line. Dr. Goldwin W. Howland, specialist in nervous diseases, told of the many cases which came to him from the osteopaths and chiropractors after they had failed to relieve the "kinks in the spine" and he had to pass them on to the Home for Incurables. Postmortem examinations showed that the "kinks" had been cancer of the brain and various other nervous diseases. Dr. Clarence L. Starr made out a strong case for the orthopedic surgeons. Dr. Charles R. Dickson stated that the Roentgen ray in the hands of an unqualified man was as dangerous as strychnin. Dr. Charles J. C. O. Hastings, M. O. H., Toronto, and Dr. John W. S. McCullough, chief health officer for Ontario, made strong attacks against licensing any one to practice medicine who had not passed the prescribed examinations. Dr. McCullough presented the following memoranda from the Ontario Board of Health: (1) The standard of medical education should be maintained and with the advance of scientific knowledge increased. (2) Those entering on the study of medicine should have a good preliminary education equal at least to honor matriculation. (3) The course of study should embrace at least five years of nine months each. (4) Since it is admitted that the fundamental principles of medicine embrace a thorough knowledge of anatomy, physiology, biology, physiologic chemistry, bacteriology, pathology, diagnosis, as well as clinical experience, these subjects must be included in the course of study, no matter what form of treatment any physician desires to pursue. (5) No unqualified man or woman should be allowed to practice medicine in any shape or form. The nursing profession also placed its views before the commission. The suggestions included the establishing of a chair of nursing in the University of Toronto, and the appointment by the provincial government of a council for the education of nurses to consist of seven members, two to be medical men and the remaining five to be nurses. It was also proposed that an inspector of nurse training be appointed, and that a uniform examination be established twice a year with nurses as examiners. The fact was presented to the commissioner that there are no schools or colleges in Canada for osteopaths or chiropractors, and that such practitioners are not licensed in England.

GENERAL

Dr. Carter Seriously Ill.—It was reported from Washington, November 18, that Asst. Surg.-Gen. Henry R. Carter, U. S. P. H. S., who recently went to Porto Rico to study dengue, is critically ill with that disease.

Eye, Ear and Throat Specialists Will Meet.—The twenty-first annual meeting of the American Academy of Ophthalmology and Oto-Laryngology will be held in Memphis, Tenn., December 5 to 7, under the presidency of Dr. John E. Brown, Columbus, Ohio.

Southern Medical Women Elect Officers.—At the third annual meeting of the Association of Southern Medical Women at Dallas, November 10, the following officers were elected: president, Dr. Mary E. Lapham, Highlands, N. C.; vice presidents, Drs. Mary A. Parsons and Mary L. Strobel, Washington, D. C.; and secretary-treasurer, Dr. L. Rosa H. Gant, Spartanburg, S. C.

Distributing Points for Red Cross Supplies.—At a meeting of the American National Red Cross in New York City, recently, it was announced that Boston, Washington, New Orleans, Jeffersonville, Ind., Chicago, St. Louis, Omaha, San Antonio, Texas, El Paso, Texas, Seattle and San Francisco would be the distributing points for Red Cross supplies and mobilization centers for nurses and physicians. At present 7,000 Red Cross nurses are enrolled in the United States.

First Aid Symposium.—At the regular meeting of the Baltimore City Medical Society, November 19, a symposium on

first aid was held, in which the subject was discussed from the standpoint of the Army by Col. Louis A. LaGarde, M. C.; from the standpoint of the Navy by Surg. Richmond C. Holcomb; from that of the Public Health Service by Asst. Surg.-Gen. William Colby Rucker, and from the standpoint of the American National Red Cross by Maj. Robert U. Patterson, M. C., U. S. Army.

Baby Week.—The health officials of thirty-nine states have already pledged their cooperation in the observance of a nation-wide "Baby Week," March 4 to 11, 1916, according to an announcement of the federal children's bureau. There has been much interest manifested and many inquiries to the bureau regarding the coming Baby Week. The bureau has prepared a circular, which will be of great assistance to communities proposing to conduct local Baby Week campaigns.

Railway Surgeons Meet.—At the annual meeting of the Southern States Association of Railway Surgeons held in Dallas, November 8, under the presidency of Dr. Thomas H. Hancock, Atlanta, Ga., Dr. Southgate Leigh, Norfolk, Va., was elected president; Dr. Robert W. Knox, Houston, Texas, vice president, and Dr. Ambrose McCoy, Jackson, Tenn., secretary. A day was appointed to work with Dr. Joseph C. Bloodgood, Baltimore, in aiding the propaganda of the first aid conference.

Buy and Sell Christmas Seals.—Red Cross Christmas Seals, which were first put on sale in 1907 in the state of Delaware, are now sold throughout the United States. The educational influence of the Christmas seals campaign has been responsible for much of the present widespread interest in the campaign against tuberculosis. The worker in the Christmas seals campaign meets with an established demand for Christmas seals. The campaigns in various states have different forms. The National Association for the Study and Prevention of Tuberculosis, in cooperation with the American Red Cross, will again this year award banners for the largest sales of Christmas seals per capita for population. It is hoped that new records for total sales and interest in this worthy cause will be established this year. Over a half million dollars was raised last year. Information and literature regarding the campaign may be obtained by addressing the National Association for the Study and Prevention of Tuberculosis, 105 East Twenty-Second Street, New York City.

Bequests and Donations.—The following bequests and donations have recently been announced:

Mercy Hospital, Cadillac, Mich., $10,000, and $20,000 to be used by the municipality in the betterment of health conditions, the income to be used for paying the salary of a visiting nurse, by the will of Mrs. Delos F. Diggins.

Jewish Hospital, Kansas City, for the erection of a memorial building in honor of their mother, a donation of $15,000 from Henry, Samuel, Robert, Isadore and Charles Straus.

Women's Hospital in the State of New York and Presbyterian Hospital, New York City, each $100,000; Manhattan Eye and Ear Hospital, and New York Institute for the Deaf and Dumb, each $50,000; St. Luke's Hospital, $25,000; by the will of Mrs. Maria DeWitt Jesup.

Methodist Episcopal Hospital, New York, $5,000, and Presbyterian Hospital, $1,000, by the will of George Clinton Batcheller.

Long Island College Hospital, Brooklyn, $75,000; House of St. Giles the Cripple, Brooklyn, $30,000, and Hudson City Hospital, Hudson, New York, $25,000, by the will of Mrs. Katherine S. Leavitt.

National Medical Day.—The National Association for the Study and Prevention of Tuberculosis makes an urgent plea that every man and woman in the United States of adult age join in the movement for annual or other periodic medical examination of themselves. During the week from December 6 to 12, known as tuberculosis week, one day, December 8, is asked to be observed as a national medical examination day. The association has issued a circular describing in detail how the advantages of medical examination may be obtained and details certain physical impairments. This circular is sent on request from the office of the association, 105 East Twenty-Second Street, New York City.

Health by Pictures.—The United States Public Health Service has opened a new campaign to teach the people of the country to combat disease. It has established a "stereopticon loan library," the first of its kind. This library is sending out daily, at the request of sanitarians, educators and other persons interested in the promulgation of personal and public sanitation, slides portraying the different phases of the subjects. The surgeon-general's office has prepared catalogs containing photographs of the slides and descriptive matter thereon. These books are being sent out to persons and organizations interested, so that request may be made for the particular slides desired for lectures in the various communities. A wide range of subjects is covered by the stereopticon loan library. It portrays sanitary conditions in Alaska and covers the whole field of yellow fever. There are special collections on the diseases of children, the hookworm, leprosy, malaria, milk production, mouth hygiene, pellagra, plague, rural schools, smallpox, tropical diseases, tuberculosis and typhoid fever. There are duplicate sets of these slides, so that the service is able to supply more than one call at the same time, should any of them prove more popular than others. The new library rapidly is growing in demand, and individuals as well as state and local health authorities and schools throughout the country are sending in their requests for the pictures. This new scheme performs a twofold function. It provides a logical system of public health education, while at the same time furnishing entertainment for the people. It also enables the service to spread the doctrine of personal hygiene and public sanitation thus over a large field, and possibly reach many persons who could not be interested in the reading and study of dry technical pamphlets on these important subjects.

WAR NOTES

American Physicians and Sanitarians Decorated.—Crown Prince Alexander of Serbia decorated forty-three American physicians and sanitary engineers for their services in controlling typhus fever.

Obligation of the Red Cross to the Armed Forces of the United States.—The American Red Cross has issued a circular of information regarding the obligation of the American Red Cross to the armed forces of the United States. These obligations are divided into three classes: funds, personnel and supplies. The personnel is divided into three classes: including those of the trained personnel who are willing to serve wherever needed; those willing to serve in their home country only, and those willing to serve at their places of residence only. From the first class only are taken the personnel for field columns, hospital columns, supply columns and information bureau sections.

More Hospital Supplies Shipped.—The American Red Cross shipped on the steamer *Rochambeau*, from New York, November 6, 12,130 pounds of relief contributions for the sick, wounded and destitute in France, consigned to the American Relief Clearing House, Paris, and also 7,000 pounds of supplies for Armenia, 15,000 pounds of hospital supplies for German prisoners in Russia and 4,875 pounds for the Russian Red Cross. This last consignment was sent in care of the Russian minister for foreign affairs, Petrograd.——Nearly 10,000 cases of medicines and medical and surgical supplies for use in military hospitals in England and on the British war front, were shipped on the steamer *Colonian*, from Boston, November 6.

Third Harvard Surgical Unit Sails.—The Third Harvard Surgical Unit sailed from New York for Falmouth, England, on the steamer *Noordam*, November 17. The unit is in charge of Dr. David Cheever, Boston, and consists of thirty-six nurses and the following physicians: Drs. John L. Bremer, Boston; Bronson Crothers, Cambridge, Mass.; Abram L. Van Meter, Boston; John F. Dillon, San Francisco; R. H. McNair, Springfield, Mass.; Frank A. Smith, R. S. Catherton, Armond A. Halliday, Toronto; Edward B. Towne, Boston; William D. B. Jack, Vancouver, B. C.; George Benet, Boston; Eben W. Fiske, Boston; Frank Abbott, Toronto; Lawrence R. Hill, Concord, N. H.; Winford O. Wilder, Pittsfield, Mass.; A. Gale Straw, Manchester, N. H.; E. O. Thomas, John C. Phillips, Wenham, Mass.; George Osgood, Cohasset, Mass.; George M. Watson, Manchester, N. H., and Macy Brooks, Philadelphia. Sir Wilfred T. Grenfell of Labrador expects to associate himself with the unit and will sail early in December for England.

LONDON LETTER

LONDON, Nov. 5, 1915.

The War

THE POSITION OF MEDICAL STUDENTS

The position of medical students is the subject of a good deal of discussion. On the one hand, the government is appealing to every physically fit man of military age to join the combatant forces of the greatest voluntary army the world has ever seen. On the other hand, the shortage of physicians, which has frequently been pointed out in THE JOURNAL, will be increased if medical students are withdrawn from their studies. The authorities have decided that students in the fourth and fifth years of study should complete their course as rapidly as possible but that students in the first, second and third year should join the army. The effect of recruiting is shown by the statistics of ten leading medical schools, in which, during the first year of the war, the number of students was 1,891, as compared with the normal number of 2,562. The number of medical students who have entered Cambridge University this year is forty-one, as compared with 116 in the year 1913. At St. Thomas's Hospital, London, the number is 45 per cent. below the average. The director general of the Army Medical Corps has asked for an additional 2,000 physicians before Christmas for war service. The casualty lists of one week show the names of fifteen physicians, and the obituary lists of physicians killed usually three or four, Sir D. Macalister, in his presidential address at the opening of the present session of the General Medical Council, said that within the next few months every qualified man of suitable age who was fit for the work of an officer in the medical corps would be needed. The profession looked to the public to lighten the sacrifices and burdens which all must endure in these days, both by loyalty to the absent and by consideration for those who took their place. The proportion of country physicians who had been set free for military service was higher than that from the large centers of population. The town physician, owing to the somewhat loose attachment of his patients to him, feared that they might be alienated if he went into the army. The medical war committees were endeavoring to promote equitable agreements between practitioners who remained on civil duty and their colleagues on active service, and he thought the profession had given abundant proofs that it would not be wanting in duty or in self-denial. From the British dominions and from other countries over 240 physicians had been registered this year, and when certain reciprocity arrangements had been completed, the number from Canada would be considerably increased. Although the War Office authorities recognized that the withdrawal from professional instruction of large numbers of medical students, of the first years, would have a serious effect on the future, they had deemed it inadvisable to discourage junior students who offered themselves for combatant service. The result of medical students accepting commissions and enlisting was that the prospective shortage of 250 qualified practitioners per annum, which he had mentioned on a former occasion as probable during the coming years, would almost certainly be exceeded. There was one direction in which it appeared likely some economy of medical students might be effected. The minor vessels of the fleets carried a surgical "probationer," and for this work medical students who had completed their physiologic and anatomic studies and had been instructed in surgical dressing are preferred. He was authorized to make it known that any "probationer" who after, say, six months' service, desired to present himself for a professional examination or to resume his studies, would be granted leave of absence or be demobilized, and a less senior student be appointed in his place. By such rotation of service, a succession of students might continue to be employed in war work and yet the qualification of none would be unduly delayed.

THE ROYAL COLLEGE OF SURGEONS

The manner in which the war is permeating our whole national life is shown by the recent report of the College of Surgeons. Six members of the staff have enlisted in the army. The physiologic curator of the museum is serving in connection with the voluntary hospital under the French Red Cross. It is proposed to transfer temporarily a pathologic attendant in the museum to the Army Medical Service for duties in connection with the transport to this country of pathologic specimens from military sources. In several cases, candidates are allowed to present themselves somewhat earlier than would otherwise be allowed. Moreover, time spent as assistant on active service in a naval vessel or in a naval or military hospital, or any hospital utilized by the naval or military authorities, not exceeding six months, may be allowed to count for the equivalent period of medical and surgical hospital practice and for three months each of medical clinical clerkship and surgical dressership, provided that a satisfactory certificate is produced from the principal medical officer under whom the assistant serves.

PARIS LETTER

PARIS, Oct. 28, 1915.

The War

MEASURES FOR THE BETTER UTILIZATION OF MEDICAL ABILITY

Because of the constant increase of the staff of the medical service and the desirability of having exact information available with regard to the officers of the service, the assistant secretary of the military medical service has ordered a report to be drawn up for each officer and each civilian physician employed in a military establishment, to permit the best utilization of each man's abilities. Each individual report is to show, apart from the physician's military titles, the following data: university titles (professor, agrégé professor in a medical school, prosector, anatomic assistant, head of a laboratory, etc.); hospital physician (physician or surgeon of the hospitals, head of clinic, surgical assistant, hospital intern); specialty (mention particulars, such as directing a surgical clinic, a bacteriologic or roentgenographic laboratory, etc.).

THE SANITARY PROTECTION OF THE TROOPS IN THE FIELD

The novel conditions of trench warfare, the use of previously unfamiliar chemical weapons, such as asphyxiating or toxic gases, and the necessity of protecting our men against poisoned drinking water—all these considerations have necessitated the organization of a new protective service. The medical service has just organized about 200 toxicologic laboratories to examine foodstuffs and drinking waters, to study the ways and means for combating asphyxiating gases and other dangerous chemical products, and to assist in solving all problems of disinfection. The laboratory workers, who are selected after a rigid examination, are in the main pharmacists, court experts, doctors or licentiates in science, or holders of various teaching positions in our colleges and schools. The authorities of the medical service will summon them to Val-de-Grâce, part at a time, to receive instructions with regard to analytic methods to be used and measures to be employed in case the enemy should make use of new deleterious gases. Each laboratory is supplied with material and indispensable chemical reagents, so that it can answer promptly the most urgent question. Thus the drinking waters for troops arriving at new quarters will be analyzed, rejected or purified, foodstuffs will be carefully examined, gases or deleterious products will be identified so that they may be combated with chances of success, and the disinfection of trenches, buildings, clothing, etc., performed under the oversight of a competent specialist.

ARTERIAL INTUBATION AS A SUBSTITUTE FOR IMMEDIATE LIGATURE IN WOUNDS OF LARGE VESSELS

At a recent session of the Académie de médecine Dr. Tuffier, agrégé professor at the Faculté de médecine de Paris and surgeon of the hospitals, gave an interesting address on this subject. Ligaturing large arteries, when these are wounded, immediately suppresses the circulation in the whole limb or organ tributary to the wounded vessel. This sudden suppression may cause gangrene of the limb and necessitate amputation or produce serious functional disturbances. To avoid such results, Tuffier has devised a method that he calls "arterial intubation." It consists in reuniting the two cut ends of the vessel by a special tube which permits the circulation to continue for some days. Suppression of the circulation being progressive, the troubles mentioned above are avoided. The difficulty consists in avoiding the coagulation of the blood in the tube. For this purpose Tuffier makes use of instruments which have been employed in transfusion, namely, silver tubes with extremely thin walls which have been placed in boiling paraffin. This paraffin coating permits the blood to circulate in the tube without coagulating or at any rate makes the coagulation extremely slow.

As an instance in favor of the new method, the applications of which in military surgery may become very numerous,

Tuffier reports the case of a patient with a transverse wound of the elbow, cut by machinery; the forearm and hand were cold and livid, without trace of circulation, on the side of the wound. Seven and a half hours after the wound, a relatively long time, the circulation was reestablished by means of a 2-mm. paraffined tube uniting the brachial artery to the radial artery of the forearm. The circulation was immediately reestablished and the radial pulse was perceived for ten hours; the forearm and the hand became warm. Three days later the tube was removed. There was only a partial success, owing to the small caliber of the tube employed and the relatively considerable time which had elapsed between the injury and the intubation. Still only a part of the hand underwent sloughing. It is, in short, a method which will render valuable service in the conservation of limbs after serious traumatism of the arteries.

PATHOLOGIC AND SIMULATED ALBUMINURIA

At a recent session of the Société de biologie, Drs. A. C. Hollande and J. Gaté presented a study of one of the most interesting questions for military physicians, that of the simulation of albuminuria by the introduction into the urine of the subject under examination, by means of an intravesical injection, of a certain quantity of egg albumin. From their investigations it appears that the presence of egg albumin in human urine may be ascertained by Maurel's fluid (250 c.c. of 33 per cent. sodium hydroxid; 50 c.c. of 3 per cent. copper sulphate; 700 c.c. of pure acetic acid) and precipitins. Important indications are also furnished by the macroscopic and microscopic examination of recently voided urine. The rapid disappearance (within from two to four days) of albumin from the urine of the subject under examination, or disappearance after the lavage of the bladder confirms the results of chemical procedures.

PLANTS SUITABLE FOR USE IN THE SANITATION OF BATTLEFIELDS

In a previous letter (THE JOURNAL, Aug. 28, 1915, p. 813) I mentioned various plants which are suitable for the sanitation of battlefields because they have in high degree the faculty of absorbing rapidly decomposing organic matter. MM. Vilmorin and Mottet have just called attention, in *La Nature*, to various graminaceous and leguminous forage plants, annual and perennial, that might profitably be used in the zones of battle for purifying the land and furnishing harvests of fodder, a most valuable resource in view of the impoverishment of the country with respect to cattle and the need of increasing our herds as rapidly as possible. Among the annual graminaceous plants, the authors mention various species of maize, of millet, of sorghum; among the perennial graminaceous plants, the tall oat grass (*Arrhenaterum elatius*), which is suitable for all kinds of soils, and a number of different species which are suitable for soils of various characters; among the annual leguminous plants, the red clover, the velvet vetch and other vetches, the kidney bean, and some varieties of peas; among perennial leguminous plants, alfalfas, sainfoin, etc. These perennial leguminous plants, because of their very long roots, are most valuable for the purification of battlefields. Annual leguminous plants, such as peas, winter vetches and red clover, sown at the end of summer or in autumn, furnish an early forage crop in the spring, and leave the ground free for the immediate planting of another crop of some such plant as maize or Jerusalem artichoke. Thus the absorption of decomposing organic matter is considerably increased, while the land is producing crops all the year and yielding a double harvest, thereby serving both public salubrity and the interest of agriculture.

Death of Prof. Albert Malherbe

Dr. Albert Malherbe, formerly professor of pathologic anatomy and honorary director of the Ecole de médecine de Nantes, has just died in his seventieth year. He was the author of interesting works on sarcoma. Professor Malherbe had been in the service of the school for forty years. He was a corresponding member of the Académie de médecine.

Foundation of New Chairs in the Faculté de médecine de Paris

On the recommendation of the minister of public instruction, there were created by a decree dated Oct. 7, 1915, a chair of topographic anatomy and a chair of bacteriology in the Faculté de médecine of the University of Paris.

Marriages

JOSEPH HALL WHITELEY, M.D., Bonaparte, Iowa, to Miss Nellie Elizabeth Linder of Libertyville, Iowa, at Des Moines, Iowa, October 27.

GEORGE OSGOOD, M.D., Cohasset, Mass., to Miss Barbara Kendall Bolles of Boston, at her summer home in Cohasset, November 7.

LEE ROY MCBURNEY, M.D., Belt, Mont., to Miss Birdie Josephine Charleson of Chicago, at Great Falls, Mont., October 2.

JOHN MARTIN EARNHARDT, M.D., Mount Pleasant, N. C., to Miss Daisy Myrtle Bost of Philadelphia, November 10.

LYNN BRIAN VAUGHAN, M.D., Hurley, S. D., to Miss Viola Constancia Fraser of Downers Grove, Ill., November 16.

WARREN DEWEESE COY, M.D., Youngstown, Ohio, to Miss Alma Shollenberger of Montgomery, Pa., November 3.

CHARLES WALLACE ARMSTRONG, M.D., Troy, N. C., to Miss Mabel Harris of Roxboro, N. C., November 9.

JAMES BROWN BIGGS, M.D., Bowling Green, Mo., to Miss Edna Major of Sedalia, Mo., November 10.

ERWIN HARE MUDGE, M.D., to Miss Florence Minton, both of Westfield, N. Y., November 3.

JOHN WOODLY WALLACE, M.D., to Miss Helen Archey, both of Concord, N. C., November 12.

JOHN HENRY O'SHEA, M.D., to Miss June Twohy, both of Spokane, Wash., November 24.

JOHN WHITING HARGIS, M.D., to Miss Edythe Grant, both of Pensacola, Fla., October 30.

SILVIES S. FULLER, M.D., to Miss Maud Wilson, both of Idaho Falls, Ida., October 30.

DORRIS MAY PRESSON, M.D., to Mr. Arthur H. Kraus, both of Augusta, Me., October 27.

Deaths

George E. Ranney, M.D. University of Michigan, Ann Arbor, 1863; aged 76; a member from 1866 to 1886, secretary and in 1891 president of the Michigan State Medical Society; president of the Michigan Central Medical Society in 1873; of Lansing, Mich.; division surgeon of the Chicago and Grand Trunk Railroad; surgeon of the Second Michigan Volunteer Cavalry during the Civil War, and a prisoner in Libby Prison, Richmond, Va., who had conferred on him two Congressional medals of honor for gallantry in action; formerly state inspector of communicable diseases; organizer of the State Board of Health and of the Health Department of Lansing; died in the Michigan Karlsbad Sanatorium, Lansing, November 11, from cerebral hemorrhage.

William S. Holliday, M.D. Louisville (Ky.) Medical College, 1874; aged 65; of Monmouth, Ill.; a member of the Illinois State Medical Society and for more than forty years a practitioner of Warren County, Ill.; county physician of Warren County from 1876 to 1882; and coroner from 1881 to 1883; for more than twenty-five years a member of the city council of Monmouth; died in the Monmouth Hospital, November 6, from pulmonary embolism, two weeks after an operation for appendicitis in which a gangrenous appendix was found.

J. B. Gregg Custis, M.D. New York Homeopathic Medical College, New York City, 1878; aged 60; president of the board of medical supervisors of the District of Columbia and formerly president of the American Institute of Homeopathy; a director of the National Capitol Bank, Washington, D. C.; died at his summer home on Grindstone Island, Thousand Islands, N. Y., November 2, from hemorrhage of the stomach.

James Taylor Jones, M.D. Washington University, Baltimore, 1870; aged 59; a member of the Tennessee Medical Association; a Confederate veteran; formerly president of the West Tennessee Medical and Surgical Association and one of the best-known practitioners of that part of the state; died at his home in Jackson, Tenn., November 5, from pleuropneumonia.

Horatio L. Foster, M.D. New York Homeopathic Medical College, New York City, 1881; aged 58; a Fellow of the American Medical Association; formerly mayor of Reed

City, Mich.; local surgeon of the Grand Rapids and Indiana Railroad, and surgeon to the Reed City Sanitarium; died suddenly, November 7, in his car near Orono, Mich.

Arthur Pollard Mulligan, M.D. Bellevue Hospital Medical College, 1893; aged 55; of Salida, Calif.; a member of the Medical Society of the State of California; formerly surgeon for the Southern Pacific System; who was thrown from his buggy in a runaway accident on his ranch near Modesto, Calif.; died in a hospital in Modesto, November 5.

Howard Johnston Lee, M.D. University of Wooster, Cleveland, 1876; aged 64; a Fellow of the American Medical Association; for many years a practitioner of Cleveland, but since 1914 a resident of St. Johnsbury, East, Vt.; a member of the staff of Charity Hospital, Cleveland; died at his home in St. Johnsbury, East, Vt., November 5.

Edgar Miller, M.D. Ensworth Medical College, St. Joseph, Mo., 1905; aged 31; a patient in State Hospital No. 2, St. Joseph, Mo.; formerly a practitioner of Mound City, Mo.; was struck by a Burlington passenger train near Platte River, November 3, and died in a hospital in St. Joseph from his injuries on the next day.

Joseph Albright, M.D. Trinity Medical College, Toronto, 1873; aged 78; a member of the staff of Butterworth Hospital, Grand Rapids, Mich.; for more than forty years a practitioner of Grand Rapids and formerly an alderman and a member of the board of education; died at his home in Grand Rapids, November 8.

Norton Jerome Sands, M.D. College of Physicians and Surgeons in the City of New York, 1868; aged 70; a Fellow of the American Medical Association; of Port Chester, N. Y.; a veteran of the Civil War; a specialist on diseases of the eye; twice president of the village of Port Chester; died at his home, November 14.

Charles A. Church, M.D. New York Homeopathic Medical College, New York City, 1871; aged 76; at one time president of the New Jersey Medical Club; a member of the staff of the Passaic General Hospital, and chief surgeon of St. Mary's Hospital, Passaic, N. J.; died at his home in Passaic, November 12.

John F. Richards, M.D. College of Physicians and Surgeons, San Francisco, 1906; of San Francisco; while on a hunting expedition near Bear Falls, Contra Costa County, Calif., November 7, was accidentally shot by a companion, and died while being taken to the Roosevelt Hospital, Berkeley, Calif.

Charles A. Hollingsworth, M.D. University of Maryland, Baltimore, 1881; aged 58; a member of the Medical and Chirurgical Faculty of Maryland; from 1881 to 1912 a practitioner and druggist of Belair, Md., and since that time postmaster of the city; died at his home, November 10, from nephritis.

Ralph B. McCleary, M.D. Hahnemann Medical College, Chicago, 1878; aged 82; for nearly half a century a practioner of Monmouth, Ill.; a veteran of the Civil War; coroner of Warren County from 1869 to 1880; died at the home of his daughter, in Monmouth, November 12, from senile debility.

John B. Alexander, M.D. Cincinnati College of Medicine and Surgery, 1875; aged 63; of McPherson, Kan.; formerly a member of the Kentucky State Board of Health and president of the Kansas Academy of Medicine; died in the hospital in Dodge City, Kan., November 5, from disease of the kidney.

William Francis Knox, M.D. University of Pennsylvania, Philadelphia, 1854; aged 84; a Fellow of the American Medical Association; one of the founders and formerly president of the Allegheny County (Pa.) Medical Society; died at his home in McKeesport, Pa., November 12, from pneumonia.

Martin Marmaduke Burchfield, M.D. Chattanooga (Tenn.) Medical College, 1908; aged 31; physician for a coal company at Whiteside, Tenn.; died in a hospital in Chattanooga, November 13, from injuries received several weeks before when his automobile took fire near Hooker Station.

Sherman Miller, M.D. St. Louis College of Physicians and Surgeons, 1893; aged 49; a member of the Missouri State Medical Association; of Mayesburg, Mo.; while returning from Clinton, Mo., in his automobile, was drowned in a ditch by the overturning of his car.

George M. Burdette, M.D. Medical College of Georgia, Augusta, 1861; aged 78; a Fellow of the American Medical Association and a well-known practitioner of Lenoir City, Tenn.; died at his home in that place, November 4, from cerebral hemorrhage.

Frank J. Huisenga, M.D. Rush Medical College, 1895; aged 42; of Rock Valley, Iowa; formerly coroner of Sioux County, Iowa; died at his hospital in Rock Valley, November 9, from injuries received in an automobile accident the week before.

James N. Coons, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1857; Washington University, St. Louis, 1868; aged 86; a retired practitioner of Marion County, Mo.; died at his home in Palmyra, Mo.; November 9, from heart disease.

William P. Powell, M.D. Tulane University, New Orleans, 1869; aged 79; surgeon in the Confederate service during the Civil War and for many years a practitioner and druggist of Willis, Texas; died at his home in that city, November 6.

Nehemiah Davis, M.D. Jefferson Medical College, 1886; Ph.G., Philadelphia College of Pharmacy, 1878; a practitioner of Camden, N. J., and in charge of the Camden Dispensary; died at his home in Camden, October 11.

August W. Duvall, M.D. Jefferson Medical College, 1877; aged 75; a practitioner of South Philadelphia; was taken ill with uremia while on the street, November 13, and died in the Hahnemann Hospital a few hours later.

Francis C. Kienzle, M.D. Northwestern University Medical School, Chicago, 1909; aged 39; a Fellow of the American Medical Association; died in his apartment in Chicago, November 15, from paratonsillar abscess.

Lawrence S. Ball, M.D. American Medical College, Eclectic, Cincinnati, 1855; aged 86; for sixty-five years a practitioner of medicine and druggist of Prairieton, Ind.; a veteran of the Civil War; died at his home, November 1.

David A. Amoss, M.D. Homeopathic Hospital College, Cleveland, 1880; aged 58; of Cobb, Ky.; died in the Rockefeller Institute, New York City, November 3, after an operation for the removal of a tumor of the throat.

Harry Daniel Reutter, M.D. Jefferson Medical College, 1884; aged 54; formerly a member of the Medical Society of the State of Pennsylvania; died at his home in Duncannon, Pa., October 30, from cerebral hemorrhage.

Joseph Shields Howe (license, Pennsylvania, 1882), aged 78; a practitioner of Industry and Rochester, Pa., for forty-five years and a veteran of the Civil War; died at the home of his daughter in Los Angeles, October 28.

Alexander C. Freeman (license, Indiana, 1890), aged 81; for more than forty years a practitioner of Kokomo, Ind.; was struck by a passenger train near his home, November 1, and died from his injuries two hours later.

Buehler Shoup Boyer, M.D. University of Maryland, Baltimore, 1911; aged 30; medical examiner for the Baltimore and Ohio System at Parkersburg, W. Va.; died in that place, August 8, from subacute nephritis.

John F. Brendel, M.D. Physio-Medical College of Indiana, Indianapolis, 1892; aged 62; formerly a Fellow of the American Medical Association; died at his home in Zionsville, Ind., November 5, from arteriosclerosis.

Samuel L. Nash, M.D. University of Michigan, Ann Arbor, 1863; University of Victoria College, Coburg, Ont., 1865; aged 83; died at his home in Bath, Ont., July 7, from carcinoma of the stomach.

William Lawrence Bailey, M.D. Chattanooga (Tenn.) Medical College, 1907; aged 40; a Fellow of the American Medical Association; died at his home in Coronaca, S. C., October 20.

Frank Dexter Harter, M.D. Chicago Homeopathic Medical College, 1900; aged 42; died at his home in Grand Rapids, Mich., October 31, from septicemia due to an ulcerated tooth.

John A. Murphy, M.D. Jefferson Medical College, 1848; aged 93; of Island Mills, Tenn.; died in Johns Hopkins Hospital, Baltimore, November 4, after an operation for prostatitis.

Frederick Russell S. Brown, M.D. Hahnemann Medical College, Chicago, 1898; aged 45; died at his home in Doerun, Ga., July 30, from intestinal obstruction.

John A. Orr, M.D. University of Louisville, Ky., 1877; aged 64; of Verona, Miss.; died in Memphis, Tenn., October 24, from appendicitis.

John Jefferson Manard, M.D. Tennessee Medical College, Knoxville, 1895; of Morristown, Tenn.; died near that place about November 2.

J. R. Sample, M.D. New Orleans School of Medicine, 1886; aged 74; of Summit, Miss.; died at the home of his daughter in Jackson, Miss., November 8, from acute gastritis.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

LAXATIVE BROMO QUININE

"Laxative Bromo Quinine," which for years has been fraudulently advertised under the claim that it "Cures a Cold in One Day," is put on the market by the Paris Medicine Company, St. Louis, Mo. Apparently, the business was founded by one E. W. Grove, president of the concern, who is said to have amassed a fortune in the business. As one newspaper has said, the Paris Medicine Company "has changed its promoter from a salaried drug clerk to a multimillionaire in twenty years' time."

In addition to Laxative Bromo Quinine, the Paris Medicine Company also puts on the market "Dr. Porter's Antiseptic Healing Oil," "Pazo's Pile Ointment" and "Grove's Pepsin Coffee." While Laxative Bromo Quinine is sold as a "headache remedy," "Grove's Pepsin Coffee" is sold under the claim that it is "the only harmless headache remedy"!

Some of the claims that have been, or are being made for Laxative Bromo Quinine are, in addition to the slogan already quoted:

"Cures Grippe—prevents Grippe."

". . . removes the cause of Colds, Coughs, Headache, Neuralgia, Grippe, Feverish and Malarious Conditions. . . ."

"The quinine that does not affect the head."

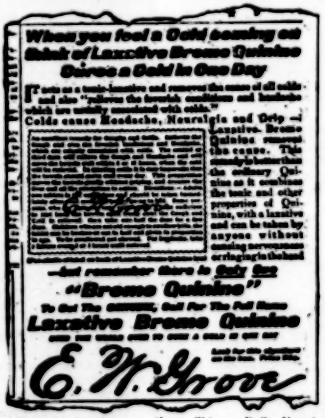
"Laxative Bromo Quinine will be found better than the ordinary quinine."

"Relieves a Cold in the Head in the shortest possible time."

"For Colds, Coughs, La Grippe, Bronchitis, Catarrh and Headache."

"AN IMPROVED QUININE, DOES NOT CAUSE NERVOUSNESS NOR RINGING IN THE HEAD."

Laxative Bromo Quinine Tablets were subjected to analysis in the Chemical Laboratory of the American Medical Association. The report of the chemist, which will appear in full in the Annual Report of the Laboratory for 1915, may be summarized as follows:


When you feel a Cold coming on take Laxative Bromo Quinine and Cure a Cold in One Day

It acts as a tonic-laxative and removes the cause of all colds and also "relieves the headache, weakness and headache which are usually associated with colds."

Colds cause Headache, Neuralgia and Grip—Laxative Bromo Quinine removes the cause. This remedy is better than the ordinary Quinine as it combines the tonic and other properties of Quinine, with a laxative and can be taken by anyone without causing nervousness or ringing in the head

—and remember there is only one "Bromo Quinine"

To Get The Genuine, Call For The Full Name

Laxative Bromo Quinine

E. W. Grove

Typical advertisement (from Chicago *Daily News*) of Laxative Bromo Quinine.

CHEMIST'S REPORT

Laxative Bromo Quinine comes in the form of light brown tablets, possessing a faint odor and a bitter, rather sharp taste. Each tablet is stamped with the letters "L. B. Q." Qualitative tests showed the presence of aloin or aloes, quinin or cinchona alkaloids, phenacetin, caffein, starch, small quantities of chlorid and sulphate and a trace of bromid. Quantitatively, the tablets were found to have:

Phenacetin	44.78 per cent.
Caffein	4.32 per cent.
Quinin (or cinchona alkaloids)	8.91 per cent.
Starch	17.58 per cent.
Ash	5.00 per cent.
Bromid ($Br^{'}$)	0.51 per cent.
Chlorid ($Cl^{'}$)	0.40 per cent.
Sulphate ($SO_4^{''}$)	0.20 per cent.
Aloin or aloes, and undetermined (by diff.)	18.29 per cent.

From the analysis it is concluded that Laxative Bromo Quinine is a mixture consisting mainly of phenacetin and aloin, with smaller quantities of caffein and quinin and only a trace of bromid.

Based on the foregoing, it appears that each tablet of Laxative Bromo Quinine (weighing 4½ grain) contains, as its essential ingredients:

Phenacetin (about)	2 grains
Caffein	½ grain
Quinin or cinchona alkaloids	⅛ grain
Aloin or aloes	Undetermined

While the name "Bromo Quinine" naturally gives the impression that bromin and quinin are the important ingredients, analysis shows that the bromid content is only 1/200 of the whole and corresponds to only about 1/30 of a grain of potassium bromid or 1/500 part of the pharmacopeial dose.

The formula for Laxative Bromo Quinine Tablets, apparently, was changed about the time the federal Food and Drugs Act went into effect. At any rate, an analysis made for the American Medical Association in 1905 indicated that, in addition to the laxative principle, the tablets contained acetanilid, quinin sulphate and caffein. No trace of bromin was found at that time. An analysis made by the state chemists of North Dakota, and published in the Annual Report of the North Dakota Agricultural Experiment Station for 1907, also failed to disclose the presence of bromin. According to this report, when the North Dakota authorities notified the Paris Medicine Company of the results of their analysis, the company stated that previous to the enactment of the federal Food and Drugs Act "they used the combined alkaloids of cinchona . . . as found in the cinchona bark, but were advised by the government to use some form of bromid in their preparation, and that they had since been using the bromid and quinin." The North Dakota chemists were thereon furnished a sample of the "New product," which "on analysis showed the presence of a small amount of quinin and bromin."

The attempt of the manufacturers of Laxative Bromo Quinine to make the public believe that this product is "an improved quinin" and "better than the ordinary quinin" as well as "the quinin that does not affect the head," is entirely in keeping with the general policy of falsehood and deceit so characteristic of the nostrum business. The real reason, of course, that Laxative Bromo Quinine Tablets do not affect the system in the same way as ordinary quinin is that there is practically no quinin present. While the average dose of alkaloidal quinin is 4 grains, the amount of this substance in Laxative Bromo Quinine is but ⅜ of a grain. Put another way it means that, in order to get an ordinary pharmacopeial dose of quinin, it would be necessary to take ten Laxative Bromo Quinine tablets, and if this were done, the person taking it would get 20 grains of phenacetin, a dangerously poisonous dose.

Again referring to the disparity between the composition of this preparation and the name, it is worth noting that one of the rulings, made by the officials who are intrusted with the enforcement of the federal Food and Drugs Act, declares that "an article containing more than one . . . active medicinal agent is misbranded if named after a single constituent." As the active medicinal agents in Laxative Bromo Quinine are not bromid or quinin but rather phenacetin and aloin, it seems strange that the company putting out this product has so far escaped prosecution under the federal law.

Laxative Bromo Quinine in addition to containing the dangerous heart-depressing and habit-forming drug, phenacetin, is a fraud both in name and in method of exploitation. In a full-page advertisement appearing in the *National Druggist* some months ago, the Paris Medicine Company stated that it was "giving the retail drug trade a much larger profit than they receive on any other leading advertised article." If this is true and so long as there are millions in the sale of this preparation, the publication of the facts just given will not, presumably, greatly affect the business.

SOME MISCELLANEOUS NOSTRUMS FOR EXTERNAL APPLICATION

PERRY'S MOTH AND FRECKLE LOTION

Perry's Moth and Freckle Lotion Compound, according to the Report of the Connecticut State Chemists for 1914, is put on the market by Brent Good & Co., New York City. According to these chemists, the preparation is another one of the bichlorid of mercury solutions containing in addition a small amount of a lead salt. The Connecticut report, commenting on the claim in the circular that this "lotion is for the safe and speedy eradication of moth patches, freckles and tan" says: "No preparation containing 16.5 parts of corrosive sublimate per 1,000 can be considered a 'safe' remedy even for external use."

PYROXIN

Pyroxin, a preparation sold on the "prescription fake" method, is sold as an eyebrow and eyelash grower, for example:

"Plain Pyroxin applied to thin, straggly eyebrows with finger tips causes them to grow in thick and beautiful."
"Eyelashes will come in long and curly if Pyroxin is applied to the roots with forefinger and thumb."

This nostrum has been the subject of reports by the state chemists of North Dakota, New Hampshire, Indiana, Ohio, Kansas and Michigan. These reports agree in exposing Pyroxin as being essentially perfumed vaseline! According to the Indiana State Board report, while this stuff sells for $1 a package, the cost of the ingredients is 2 cents.

ROSE-KAYLOIN

Rose-Kayloin is another one of the preparations put out by the Blackburn Products Co., Dayton, Ohio. It is advertised in the "Dr. Lewis Baker" fake "health department." Rose-Kayloin, according to the reports of state chemists, is a rose-scented, pink powder, containing, according to the chemists of the Indiana State Board of Health:

Sulphur	80 per cent.
Potassium carbonate (washing soda)	15 per cent.

This stuff is recommended in the Dr. Lewis Baker "Answers to Correspondents" for numerous conditions. For instance:

"Valentine:—A person afflicted with chronic ulcers, itching skin and constipation, as you say you are, usually has frequent attacks of indigestion, causing the poisons of fermented food to be absorbed into the blood. This is manifested by pimples, ulcers, itching, etc. I have had great success prescribing an ointment of rose-kayloin, 2½ drams; lanolin, 2 oz. Mix and apply to the skin or sores two or three times daily after a thorough cleansing with soap and water."

And then this:

"Katherine Anxious:—You ask for a preparation to remove freckles (and tan). I don't think well of face creams, but this face wash is most effective if persistently and regularly used. It removes tan and freckles by absorption: Potassium Carbonate 3 drams, Sodium Chloride 2 drams, Rose-Kayloin, 2½ drams (package), Orange Flower Water 2 oz., Rose Water 8 oz. Mix and apply two or three times daily as a face wash, permitting it to dry on the face."

Other conditions in which Rose-Kayloin—in various combinations—is recommended, are "blackheads, pimples, boils, sore spots, and large pores in skin of the face," also "eczema," "sty on the eyelids," "itching piles," etc.

MME. RUPPERT'S FACE BLEACH

"Mme. Ruppert's World Renowned Face Bleach" is put on the market by Mme. A. Ruppert Co., New York City. According to the report of the Connecticut Agricultural Experiment Station for 1914, the label declares the presence of 6 per cent. alcohol. According to the Connecticut chemists the preparation is an alcoholic solution of bichlorid of mercury containing four parts of the mercury salt to 1,000. It also contains a small amount of benzoin. This dangerous poison, according to the same authority, "is falsely labeled 'harmless.'"

STILLMAN'S FRECKLE CREAM

Stillman's Freckle Cream has been reported on both by the Indiana State Board of Health in its bulletin on "Medical Frauds" and by Dr. Wiley in his book "1001 Tests." The preparation is put on the market by the Stillman Freckle Cream Co., Aurora, Ill., and advertised under such claims as:

"Freckles, tan or liver spots positively removed by using Stillman's Freckle Cream."

According both to Dr. Wiley and to the state chemists of Indiana, this preparation is another one of the ammoniated mercury pastes and as such is a dangerous caustic poison.

TAN-A-ZIN

Tan-A-Zin is said to be put on the market by John A. Brown, Washington, Kan. It is another one of the "Complexion Beautifiers" and, according to the state chemists of North Dakota, has for its essential ingredient ammoniated mercury.

WRINKLE LOTION

"Wrinkle Lotion" put on the market by Sarah Thompson, Terre Haute, Ind., is according to the bulletin on "Medical Frauds" of the Indiana State Board of Health, sold under the claim that it removes wrinkles. The same authority declares that it contains the following:

Alum	7 per cent.
Glycerin	29 per cent.
Water	64 per cent.

The Indiana chemists further state that the stuff sells at 50 cents and the cost of the ingredients is 3 cents.

ZINTONE

Zintone is another of the Cooper Pharmacal Company's nostrums that has been advertised as one of several "Remarkable Formulas Revealed by Valeska Suratt." Some of the claims that have been made for Zintone are:

"Produces faultless complexion quickly."
"It gives the skin a superb pinky whiteness, removes all muddiness and spots in a very short time."
"In a few weeks your complexion will be almost perfect with a bloom and freshness that is adorable."

This marvel has been reported on by the state chemists of Indiana, Kansas, Michigan and Connecticut. According to the latter, Zintone is a grayish white powder perfumed with vanillin and having the following composition.

Borax	23 per cent.
Stearic acid and soap	77 per cent.

DISCLOSING THE FORMULA

What One Druggist Thinks of the Plea that Formula Disclosure Means Ruin

The frantic efforts of the "patent medicine" fraternity to discredit the Health Department of New York City in its laudable effort to give the public some measure of protection against fraudulent "patent medicines" has been referred to at various times in THE JOURNAL. Nostrum mongers always have fought the disclosure of formulas or, in fact, the giving of any information that would make it possible for those who wish to drug themselves to know what they are taking. The reason is obvious. Take away the mystery from a "patent medicine" and you have taken away its most potent asset.

Several "patent medicine" concerns have written to New York druggists urging them to refuse to obey the law that is to go into effect on the last day of this year requiring the statement of the potent ingredients of all "patent medicines" either to be filed with the Department of Health or to be plainly printed on the labels. More than one New York druggist has openly resented this offer on the part of the "patent medicine" makers of protection against legal proceedings, if they will violate the law. In a recent issue of the New York *Tribune* a letter from one such druggist—Mendel Zagat—is printed. The letter was addressed to Smith, Kline & French Co. of Philadelphia, the purveyors of "Dr. Hand's Remedies." In replying to the letter received

from Smith, Kline & French Co. Mr. Zagat, in the name of his company, thanks the concern for its letter but adds:

"We feel, however, that we shall not have to avail ourselves of your kind offer to protect us in breaking the law."

Further, the druggist suggests, that "no manufacturer producing an honest product should be averse to obeying Dr. Goldwater's regulations." Moreover, Mr. Zagat points out that the fact that Smith, Kline & French Co. are opposed to giving the Health Department a statement of the ingredients of its preparations "is strong presumptive evidence that the claims you make for these preparations are false." Then follows this statement which, coming from an expert pharmacist, nails the specious falsehood so loudly and widely put forward by the nostrum interest:

"That you are afraid of revealing the nature of your preparations to your competitors is absurd. There is no preparation on your list that cannot be matched or bettered by one in the National Formulary or the United States Pharmacopeia. The sale of your preparations, and of others like them, depends on advertising and not on therapeutic value."

Truth, the whole truth and nothing but the truth and, as Mr. Samuel Hopkins Adams says in commenting on the letter as it appears in the *Tribune:*

"What is true of the Smith, Kline & French Co.'s secret preparations is true of practically all secret nostrums. The secrecy is but a pretense, a 'bluff.' It is reduced to the lowest terms of absurdity by the clear logic of Mr. Zagat's professional and expert knowledge."

Correspondence

The Choice and Technic of the Anesthetic

To the Editor:—The results of the anesthetic experiments of A. D. Bevan, as described in his excellent paper (THE JOURNAL, Oct. 23, 1915, p. 1418), are very interesting and should be of benefit to any one interested in this important branch. With one item, however, I take exception, that is, the statement that: "warm ether possesses no advantage over cold." The work and experiments of anesthetists prove otherwise.

To a patient suffering from shock do we apply cold externally or internally? Nay, rather we apply heat. Why is chloroform safer in warm climates than in cold? Because it is warmer. Any fluid in a can or bottle is warmer in summer than in winter. No matter how well heated be a room, the air in it cannot prevent the formation of frost on the window. It cannot keep the window warm. The air in a comfortably heated room is pleasant to breathe. The chilliness of very cold air as we step outside of the house is unpleasant to our mouth, nostrils, lungs. Even after we have become accustomed to it, a deep breath is not pleasant. Does not the same principle apply to ether? Cold ether causes the formation of "snow" on the mask. Warmed, it does not. Cold causes contraction of tissues. Heat causes relaxation and is soothing. Warm ether causes less coughing and is more pleasant to the patient, especially if given in warm vapor with oxygen. The opinion of anesthetists is opposed to that of Dr. Bevan.

A. S. MCCORMICK, M.D., Akron, Ohio.

A National Examination Board for License to Practice

To the Editor:—In THE JOURNAL, Nov. 6, 1915, p. 1652, attention was called to the board examinations for entrance to colleges of arts, and to the fact that they were held all over the country simultaneously; that they were recognized as sufficient by all colleges, and the fees received made the board practically self-supporting. It is formed by representatives of universities and high schools or preparatory schools. The examination questions are prepared by experts, and the answers are graded by experts.

If this is possible for the many colleges in the country, how much easier it would be for the fewer state licensing boards if those of all, or at first even most of the states should form a similar board for examining graduates in medicine for license to practice. If examinations were held by such a representative board there could be no question as to the justice of reciprocity, and the long desired national examination would be attained. The laws of the states do not make it necessary for the members of the state boards to examine students personally, but to see to it that suitable examinations are held. Nothing would help more to make the standards uniform and high throughout the country.

N. S. DAVIS, M.D., Chicago.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

MEDICAL JOURNALS AND HONEST ADVERTISING

To the Editor:—Referring to your editorial "May We Count on Your Assistance?" (Current Comment, THE JOURNAL, November 13, p. 1736): The Association, which now renders such valuable aid to its members by keeping them informed as to clean advertised drugs, could still further aid physicians by publishing at intervals a list of those medical journals that "are making a creditable stand for decency in advertising." In your position you can more readily separate the sheep from the goats. It may be a delicate task, but it is one that would be an aid to the rank and file of the profession.

A. A. STAFFORD, M.D., San Francisco.

To the Editor:—Can you send me a list of medical journals (not state journals) that are devoted to therapeutics or the diagnosis and treatment of internal diseases, and that contain no objectionable advertisements?

G. A. CHILGREN, M.D., Burlington, Iowa.

To the Editor:—Your editorial "May We Count on Your Assistance?" has appealed to me. I have just notified four journals to discontinue, and for heaven's sake to clean up their advertising pages. Please send me a list of good journals on surgery, gynecology and children's diseases.

LEO W. CHILTON, M.D., Canyon City, Ore.

ANSWER.—The following journals limit advertising of proprietary medicinal preparations to announcements of such products as have been accepted for New and Nonofficial Remedies by the Council on Pharmacy and Chemistry of the American Medical Association:

American Journal of Diseases of Children, American Medical Association, 535 North Dearborn Street, Chicago, monthly, $3.

American Journal of the Medical Sciences, Lea and Febiger, 706 Sansom Street, Philadelphia, monthly, $5.

American Journal of Obstetrics and Diseases of Women and Children, William Wood Company, 51 Fifth Avenue, New York, monthly, $5.

American Journal of Physiology, Baltimore, monthly, $5.50.

American Journal of Roentgenology, New York, monthly, $5.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans, monthly, $2.

Archives of Ophthalmology, New York, bimonthly, $5.

Arizona Medical Journal, Phoenix, Ariz., monthly, $2.

Archives of Internal Medicine, American Medical Association, 535 North Dearborn Street, Chicago, monthly, $4.

Boston Medical and Surgical Journal, 101 Tremont Street, Boston, weekly, $5.

Bulletin of the Medical and Chirurgical Faculty of Maryland, Baltimore, monthly, 25 cents.

Cleveland Medical Journal, 2318 Prospect Avenue, Cleveland, monthly, $2.

California State Journal of Medicine (California and Nevada), San Francisco, monthly, $1.

Colorado Medicine, Denver, monthly, $2.

Journal of the American Medical Association, American Medical Association, 535 North Dearborn Street, Chicago, weekly, $5.

Journal of the Arkansas Medical Society, Little Rock, Ark., monthly, $1.

Journal of Experimental Medicine, New York, monthly, $5.

Journal of the Florida Medical Association, Jacksonville, Fla., monthly, $1.
Journal of the Medical Association of Georgia, Augusta, Ga., monthly, $1.
Journal of the Indiana State Medical Association, Fort Wayne, Ind., monthly, $1.
Journal of Infectious Diseases, 629 South Wood Street, Chicago, bimonthly, $5.
Journal of the Iowa State Medical Society, Des Moines, Iowa, monthly, $2.
Journal of the Kansas Medical Society, Topeka, Kan., monthly, $2.
Journal of Laboratory and Clinical Medicine, C. B. Mosby Company, St. Louis, monthly, $3.
Journal of the Maine Medical Association, Portland, Me., monthly, $2.
Journal of Medical Research, Boston, irregularly, $4.
Journal of the Michigan State Medical Society, Grand Rapids, Mich., monthly, $3.50.
Journal of the Missouri State Medical Association, St. Louis, monthly, $2.
Journal of the Medical Society of New Jersey, Orange, N. J., monthly, $2.
Journal of the Oklahoma State Medical Association, Muskogee, Okla., monthly, $2.
Journal of the South Carolina Medical Association, Anderson, S. C., monthly, $2.
Journal of the Tennessee State Medical Association, Nashville, Tenn., monthly, $2.
Kentucky Medical Journal, Bowling Green, Ky., monthly, $2.
Memphis Medical Monthly, Goodwyn Institute, Memphis, Tenn., monthly, $1.
New Mexico Medical Journal, Las Cruces, N. M., monthly, $2.
New York State Journal of Medicine, New York, monthly, $1.
Northwest Medicine (Oregon, Washington, Idaho and Utah), Seattle, monthly, $2.
Ohio State Medical Journal, Columbus, Ohio, monthly, $2.
Old Dominion Journal of Medicine and Surgery, 116 East Franklin Street, Richmond, Va., monthly, $2.
Ophthalmic Record, Chicago, monthly, $4.
Ophthalmology, Seattle, quarterly, $5.
Pan American Surgical and Medical Journal, New Orleans, monthly, $2.
Pennsylvania Medical Journal, Athens, Pa., monthly, $2.
Southern Medical Journal, Birmingham, Ala., monthly, $2.
Surgery, Gynecology and Obstetrics, Surgical Publishing Company, 30 North Michigan Avenue, Chicago, monthly, $5.
Texas State Journal of Medicine, Fort Worth, Texas, monthly, $1.50.
Wisconsin Medical Journal, Milwaukee, Wis., monthly, $2.
West Virginia Medical Journal, Huntington, W. Va., monthly, $1 (after Jan. 1, 1916).

TREATMENT OF FRIEDREICH'S ATAXIA

To the Editor:—One of our members requests us to furnish him with information on the modern treatment of Friedreich's ataxia. We can find considerable in the recent literature on hereditary ataxias but little, if anything, along the line of treatment. Can you help us out? Even though this condition is generally considered hopeless, there must have been some serious efforts made toward amelioration of symptoms and retardation of progress of the disease.

SAN DIEGO MEDICAL LIBRARY ASSOCIATION,
ROBERT POLLOCK, M.D., Secretary.

ANSWER.—As this disease, so far as we know, is always inherited, as a rule begins in early childhood and consists of maldevelopment of the central nervous system, especially of the cerebellum and certain fiber systems of the spinal cord, it is obvious that treatment can only be symptomatic. In every suspected case, however, there should be a Wassermann test and complete examination of the cerebrospinal fluid, including the Lange colloidal gold test, as congenital syphilis may be responsible for an almost identical clinical picture; in fact, ancestral syphilis is given as a factor in the true Friedreich's ataxia. If either patient or parents give evidence of syphilis, specific treatment should be used. According to Dana, arsenic may give temporary relief in the early stages. For the most distressing symptom, the ataxia, we fortunately have an important remedy, the so-called Frenkel reeducative exercises, which may be applied in this disease in the same manner as in tabes. The object is to reeducate the limbs by means of the eyes, and by utilizing to the full those pathways which are not degenerated. The principle and methods are fully set forth in H. S. Frenkel's "Tabetic Ataxia: Its Treatment by Systematic Exercises," translated by L. Freyberger (Philadelphia, P. Blakiston, Son & Co., 1902, price $3).

CARBOHYDRATE CHANGES IN BAKING AND BOILING POTATOES—NATURE OF EDEMA IN CARDIAC WEAKNESS

To the Editor:—1. Please describe the carbohydrate changes involved in baking a potato and boiling one. What is it that accounts for the sweeter taste of a baked potato?

2. Is edema of the extremities in cardiac pathology construed as a conservative process or not?

R. W. ADAMS, M.D., Newport Center, Vt.

ANSWER.—1. When a potato is boiled, the starch, which is granular in a raw potato, is converted into the so-called soluble starch, a more readily digestible form. The temperature of boiling is not sufficient, in the short time required to boil a potato, to hydrolyze much of the starch. In baking a potato, a crust is formed on the outer surface. The temperature is higher within the potato because the tension is greater, owing to the confining of the water present in the potato. With a higher temperature and tension—as occurs in baking—there is more hydrolysis than in boiling. The starch is converted into dextrin, which accounts for the sweeter taste of a baked potato.

2. The edema which occurs in cardiac weaknesses is not a conservative process. It would more likely be considered a progressive process. As the edema increases, the difficulty of the heart becomes greater and there is edema of the heart muscle, thus increasing the inability of the heart muscle to perform its work. In other edematous tissues the interference of the circulation must be considered as preponderantly adverse to the tissues affected as well as to the heart.

IODEOL AND IODAGOL

To the Editor:—The salesman has been making such extravagant claims for Iodeol and Iodagol that I am sending the literature for investigation.

FRANCIS SCHILL, M.D., Johnstown, Pa.

ANSWER.—Both Iodagol and Iodeol are said to be manufactured by E. Viel & Co., Paris. They are imported into this country by David B. Levy, Inc. Both appear to be iodin preparations. They are called in the advertising literature, "Electro-Chemical Colloidal Iodine." Iodeol is recommended in tuberculosis, pneumonia, typhoid, asthma, syphilis and other conditions as "iodine with all its potentialities . . . stripped of all its drawbacks—non-irritating, non-caustic, non-toxic, non-cumulative, injectable without pain"; "many times more active than ordinary iodine." Iodagol is recommended in specific urethritis, cystitis, arthritis, etc., under similar claims. According to the advertising literature, "It is, in fact, known that iodine when brought into the colloidal state increases its action tenfold and diminishes in toxicity to the same extent." No such fact is generally known; it would be difficult to demonstrate, and no proof is offered. Nor is any adequate evidence offered in support of the therapeutic claims made for Iodeol and Iodagol, although the assertions as to the action of Iodeol in tuberculosis and pneumonia, in particular, are susceptible of test by laboratory and animal investigation. Our correspondent is justified in calling the claims "extravagant."

THE TEACHING OF PEDIATRICS

To the Editor:—Can you furnish me references to articles on the teaching of pediatrics?

C. D. W.

ANSWER.—The following is a list of recent articles on this subject:

Marfan, A. B.: Pediatrics in the Medical Course, *Presse méd.*, Sept. 16, 1911.
Medin, O.: Teaching of Pediatrics at the University of Stockholm, *Jahrb. f. Kinderh.*, November, 1911.
Improvement of Instruction in Pediatrics, Berlin Letter, THE JOURNAL, March 11, 1911, p. 756.
Epstein, J.: Special Training in Pediatrics, *Am. Jour. Obst.*, July, 1914.
Rhodes, C. A.: Present Status of Pediatric Teaching in Sixteen Southern States Forming Southern Medical Association, *Georgia Med. Assn. Jour.*, August, 1914.
Royster, L. T.: The Pediatrician and the Section on Diseases of Children, THE JOURNAL, Aug. 14, 1915, p. 567.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALASKA: Juneau, Jan. 4, 1916. Sec., Dr. Harry C. DeVighne, Juneau.

ARIZONA: Phoenix, Jan. 4-5, 1916. Sec., Dr. John Wix Thomas, National Bank of Arizona Bldg., Phoenix.

CALIFORNIA: Los Angeles, December 14. Sec., Dr. Charles B. Pinkham, Room 527 Forum Bldg., Sacramento.

COLORADO: Denver, Jan. 4, 1916. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DELAWARE: Dover and Wilmington, December 14. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

FLORIDA: Jacksonville, December 7-8. Sec., Dr. E. W. Warren, 102 Front St., Palatka.

KENTUCKY: Louisville, December 7-9. Sec., Dr. A. T. McCormack, Bowling Green.

LOUISIANA: New Orleans, December 2-4. Sec., Dr. E. L. Leckert, 716 Macheca Bldg., New Orleans.

MARYLAND: Regular, Baltimore, December 14. Sec., Dr. J. McP. Scott, Hagerstown. Homeopathic, Baltimore, December 15-16. Sec., Dr. O. N. Duvall, 1817 N. Fulton Ave., Baltimore.

MINNESOTA: Minneapolis, Jan. 4-7, 1916. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.

MISSOURI: St. Louis, December 13-15. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

NORTH DAKOTA: Grand Forks, Jan. 4-7, 1916, Sec., Dr. G. M. Williamson, Grand Forks.

OHIO: Columbus, December 7-9. Sec., Dr. George H. Matson, Columbus.

OREGON: Portland, Jan. 4, 1916. Sec., Dr. L. H. Hamilton, Medical Bldg., Portland.

RHODE ISLAND: Providence, Jan. 6-7, 1916. Sec., Dr. Gardner T. Swarts, Providence.

UTAH: Salt Lake City, Jan. 3, 1916. Sec., Dr. G. F. Harding, 407 Templeton Bldg., Salt Lake City.

VIRGINIA: Richmond, December 14-17. Sec., Dr. J. N. Barney, Fredericksburg.

WASHINGTON: Walla Walla, Jan. 4, 1916. Sec., C. N. Suttner, Baker Bldg., Walla Walla.

Oklahoma April Report

Dr. John W. Duke, secretary of the Oklahoma State Board of Medical Examiners, reports the written examination held at Oklahoma City, April 13-15, 1915. The total number of subjects examined in was 10; total number of questions asked, 95; percentage required to pass, 70. The total number of candidates examined was 12, of whom 9 passed and 3 failed. Eighteen candidates, including 2 osteopaths, were licensed through reciprocity. Seven candidates were granted reregistration licenses and 1 candidate's license was reinstated. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Indiana University	(1914)	84
University of Louisville	(1914)	71
Baltimore Medical College	(1895)	71
Baltimore University	(1904)	73
College of Physicians and Surgeons, Baltimore	(1907)	78
St. Louis University	(1914)	77
Meharry Medical College	(1914)	74, 82
Memphis Hospital Medical College	(1911)	72
FAILED		
University of Arkansas	(1912)	66
Meharry Medical College	(191-)	46.1
Vanderbilt University	(1893)	58.3

College	LICENSED THROUGH RECIPROCITY Year Grad.	Reciprocity with
College of Physicians and Surgeons, Little Rock	(1911)	Arkansas
University of Arkansas	(1907)	Arkansas
Denver and Gross College of Medicine	(1904)	New Mexico
George Washington University	(1911)	Maryland
Atlanta School of Medicine	(1911)	Georgia
Hahnemann Medical College and Hospital, Chicago	(1896)	Kansas
Illinois Medical College	(1902)	Michigan
Kansas Medical College	(1907)	Kansas
Detroit College of Medicine	(1910)	Michigan
Eclectic Medical University, Kansas City	(1906)	Arkansas
Marion-Sims-Beaumont Medical College	(1903)	Missouri
St. Louis University	(1914)	Missouri
College of Physicians and Surgeons, Memphis	(1911)	Tennessee
Memphis Hospital Medical College	(1911)	Arkansas
Vanderbilt University	(1905)	Tennessee
University of Vermont	(1905)	Vermont

The following questions were asked:

ANATOMY

1. How much of length of spinal column is made up by intervertebral disks? 2. At what point does the spinal cord terminate? 3. Describe arrangement of gray and of white matter in spinal cord. 4. Give origin and termination of thoracic duct. 5. Give shape, weight and position of heart. Describe the pericardium. 6. Into what two principal parts is the kidney divided? In which part are the functionating structures situated? 7. Where is Petit's triangle? How is it formed? 8. How would you differentiate a movable kidney from a wandering spleen by palpation? 9. Of what artery is the middle meningeal a branch? What relation does it bear to the dura mater? 10. Give average number of red and of white blood corpuscles in a cm. of blood.

CHEMISTRY

1. What is the chemical antidote for iodin? 2. Chemically, what is albumin? 3. How would you determine, chemically, whether a urinary deposit was composed of urates or phosphates? 4. How does potassium permanganate act as a disinfectant? 5. What is the composition of the pancreatic juice? 6. What is the difference between an alloy and an amalgam? 7. What is chloroform? Give the chemical name and formula and properties. 8. What element is constantly present in the coloring matter of the blood and what elements are common in all acids? 9. Complete the equation $CaCO_3 + 2HCH = ?$ 10. Give antidotes for following: Carbolic acid, formaldehyd, nitric acid.

SURGERY

1. Give a classification of burns and constitutional symptoms. 2. What diseases attack the antrum of Highmore? 3. What are the causes of esophageal stricture? 4. Define volvulus and give its treatment. 5. What are the predisposing and what are the exciting causes of abdominal hernia? 6. Describe dermoid cysts. In what situations are they most commonly found? 7. What are the chief surgical diseases of the groin? 8. Give symptoms of stone in the kidney and treatment of same. 9. Give diagnosis and treatment of floating kidney. 10. What are the causes of ischiorectal abscess? Give treatment.

MATERIA MEDICA AND PRACTICE

1. How soon is Widal's test positive in typhoid fever? 2. How would you treat average case of intestinal stasis? 3. Treat the average case of incipient tuberculosis. 4. What is the incubation period of scarlet fever? 5. Diagnose and treat mitral regurgitation with broken compensation. 6. Give average dose of sulphate of morphin. 7. What is the emetic dose of apomorphin? 8. What effect has digitalis on heart and why? 9. What is an astringent? Give example. 10. Give hypnotic dose of chloral hydrate.

GYNECOLOGY

1. Diagnose retroversion and differentiate it from retroflexion. 2. Differentiate pyosalpinx from ectopic pregnancy. 3. Give difference in the bleeding due to carcinoma of cervix and that of submucous fibroid. 4. Name some dangers of sharp curets. 5. When should the radical breast operation be done?

OBSTETRICS AND HYGIENE

1. Describe the changes which take place in the generative organs during pregnancy. 2. What conditions may be mistaken for pregnancy? 3. On making the first examination of a woman in labor would you proceed and what would you expect to learn? 4. What is dry labor? How does it differ from normal labor, and what are the dangers accompanying it? 5. How would you distinguish one shoulder from the other where the hand and arms could not be felt? 6. How soon after delivery would you ligate the cord? How should it be dressed? 7. What condition during the third stage of labor would cause you to insert your hand into the uterus? 8. Give the external diameters of the pelvis. 9. Give a patient having tuberculosis instruction to prevent communicating it to other persons. 10. What are the most common poisons occurring in food. How may we prevent this occurrence?

PHYSICAL DIAGNOSIS

1. Name the normal thoracic landmarks. 2. Describe the phthisical thorax. 3. What is dyspnea? 4. Describe the emphysematous thorax. 5. Name the types of dyspnea. Their causes. 6. Define cyanosis. How recognized? 7. Diagnose displacement of the larynx and give causes. 8. Describe bronchial breathing. 9. Name the respiratory sounds. 10. Diagnose acute bronchitis.

TOXICOLOGY AND MEDICAL JURISPRUDENCE

1. In a case of death by poison, what organs would you select for chemical examination, and how would you prepare them for the chemist? 2. Give symptoms caused by eating poisonous fungi. In fatal cases how soon does death occur? 3. What are the important symptoms of poisoning by digitalis? 4. Name maximum dose of (a) tinct. of opium, (b) heroin, (c) white arsenic. 5. Give symptoms of poisoning from cocain and the treatment. 6. What is the duty of the state regarding preventable diseases? Name ten preventable diseases. 7. Define medical jurisprudence. 8. When may abortion be legally permitted? 9. In case of poisoning, the nature of the poison being unknown, how should the case be handled? 10. What is the best method or course to pursue in order to detect feigned mental disorder?

BACTERIOLOGY AND PATHOLOGY

1. Give the pathology of dry and moist gangrene. 2. What is eccentric and concentric atrophy? 3. Describe briefly calcareous infiltration. 4. What are: retention cysts; congenital cysts; extravasation cysts? 5. Give the pathologic changes that take place in hyperemia of the liver. 6. What is infection? Why are some red and white blood corpuscles differentiate septicemia and pyemia. 8. Name four ways by which tubercle bacilli may enter the body. 9. Give the pathologic changes that take place in arteries infected by syphilis. 10. Give the pathology of cerebrospinal sclerosis.

PHYSIOLOGY

1. Name three uses of the blood. 2. Give functions of the skin. 3. Give functions of the cerebrum. 4. Describe the sympathetic nervous system and tell its office. 5. What are the chief factors concerned in stimulating the secretion of the gastric juice? 6. What do you understand by the term digestion? Name the organs of digestion. 7. In what part of the brain is the center for sight? 8. What is the office of the cerebellum? 9. Describe spinal nerves in general where they leave the cord and divide into anterior and posterior branches and tell how the anterior and posterior divisions differ in functions. 10. Give the name and origin of the nerve that supplies motor function to the face.

Utah Reciprocity Report

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports that three candidates were licensed through reciprocity Oct. 4, 1915. The following colleges were represented:

College	Year Grad.	Reciprocity with
College Physicians and Surgeons, Chicago	(1901)	Illinois
Northwestern University	(1908)	Wyoming
Columbia University, College of Phys. and Surgs.	(1911)	New York

Book Notices

GESCHICHTE DER AUGENHEILKUNDE. Von Dr. J. Hirschberg, Drittes Buch, Zwölfter Abschnitt — Amerikas Augenärzte im 19 Jahrhundert. Paper. Price, 6 marks. Leipzig: Wilhelm Engelmann, 1915.

The preparation of a reasonably complete and well-balanced history of ophthalmology is no light task. The basic material needed for such a work is much more scattered and more difficult of access than that required for similar investigations in other sciences, while much important information—biographies in particular—can in many instances be obtained only by painstaking and repeated inquiry and search among unpublished and private sources. Many years ago Professor Hirschberg understook the work of collecting, sifting and publishing ("Handbuch der gesamten Augenheilkunde," second edition) the data for a history of ophthalmic science in all countries since its shadowy beginnings as a special department of surgery in Ancient Egypt 4,000 years ago. As a consequence, we owe this tireless worker a debt of gratitude for his remarkable series of books on the subject; and if, as in the present volume, he has fallen short of the standard set by him in some of his earlier contributions to the subject, we who know the difficulties of his problem can excuse his partial failure to solve it.

The defects of the volume under examination are much the same as those of Hirschberg's "Englands Augenärtze" (THE JOURNAL, July 31, 1915, p. 449). In the first place, the title is quite misleading. The author is supposed to be writing a history of ophthalmology in the United States during the nineteenth century; we find, however, that a considerable amount of space is devoted to the doings of ophthalmologists (and not always of Americans) in the twentieth century. It would be an improvement to delete from the subtitle the words *im 19. Jahrhundert*. The preliminary review of general medical and surgical conditions in the United States, though ostensibly carried down to the date of publication of the book, is very defective. For example, the latest educational number of THE JOURNAL referred to (or, seemingly, consulted) is that of 1905—just ten years behind the times—and surely we have advanced somewhat during the past decade! What is said about American instruction in ophthalmology is especially unfair. Nothing at all, for example, is said of the special provisions for a thorough instruction developed in the last few years at the Universities of Colorado and Minnesota, and leading to a special degree.

In one point, at least, the volume under discussion is superior to its predecessors: the items in its various bibliographies are, in general, arranged in chronological order. This was not true of Professor Hirschberg's former volumes, in which, not infrequently, the bibliographies were compiled in the greatest confusion.

One of the greatest errors in the present work consists in the failure to observe a just proportion between the space allotted to individual ophthalmologists. For example, a long bibliography is appended to the sketch of A. R. Baker, and either none at all or but scanty and incomplete ones to those of men like Aaron Friedenwald. Extremely scanty, too, are the sketches themselves, especially of such widely known men as Boerne Bettman (one-third page); George Strawbridge (one-third page); Leartus Connor (two-thirds page); John Green (one and two-thirds pages); Henry Gradle (one-half page); Aaron Friedenwald (fourteen lines); Charles A. Oliver (one and one-third pages); William F. Norris (one and two-thirds pages); George Harlan (three-fourths page); Charles John Kipp (one-third page), and A. A. Hubbell (one-third page). In most of these instances the extreme brevity of the sketches is a matter for wonder in view of the fact that abundant information is supplied about these men by the very journals, society reports, etc., which Professor Hirschberg himself acknowledges to have been his sources. The reason for this cavalier treatment of leading American ophthalmologists is a little difficult to understand. Then, too, many of the important American ophthalmologists are not merely dismissed with a few brief words; they are wholly omitted, absolutely excluded from this partial hall of fame. Among those who have been thus dealt with are Duff Warren Greene, M. H. Post, Edward Shakespeare, Joseph Pancoast, Charles Michel, George Chadwick and O. A. Griffin.

The author seems to have an uneasy feeling that he may have forgotten some deserving names in American ophthalmology because he complains that he has looked in vain in the "American Encyclopedia of Ophthalmology" for an account of our illustrious dead under the heading "American Oculists." The learned professor is not aware that, at least in the polite literature of this country, the word *Augenärtze* has not exactly the same significance as "oculists." In this particular, as in some others, we have not followed the German usage. In the list of American textbooks of ophthalmology, we note, incidentally, the omission of Ball's "Modern Ophthalmology," one of the best and most widely used books in this country. A matter of minor (and yet sufficient) importance is the great multitude of typographic errors which spot and mar this book on every page. Thus, for a very few examples: p. 8, "responsability"; p. 11, "in ninety per cents of our medical colleges"; p. 20, "Hubbel," for "Hubbell"; p. 65, "A. B. Prince, Jacksonville, Jllin"; p. 153, "Edwards Hartshorne"; p. 156, "cylindrical tenses"; p. 166, "Charles Archibald Robertson" for "Richardson"; p. 184, "Christopher Smith Fenner"; p. 188, "Blencowe Fryer." Professor Hirschberg tells us—and we heartily approve the sentiment—that he is proud of the record of his former pupil, William Campbell Posey of Philadelphia, but surely that does not justify writing him "Poosey." Even the index, in which, if in any place, the utmost accuracy should exist, is full of errors. The most provoking of these is the frequent setting down of a page number as just one less than the proper one. For example, Culbertson, Howard, 180 (should be 181).

Of almost every one of Professor Hirschberg's former historical volumes, one might truthfully say: "This is not a book, so much as the almost chaotically assembled material for a book"; yet, of the present volume one can hardly say so much; even the material for a history of ophthalmology in America is not present in this work. Some day, when Professor Hirschberg has finished the collection of data for a history of ophthalmology (collecting for all countries with equal assiduity) he will, we trust, proceed to the writing of that history.

DISEASES OF THE NERVOUS SYSTEM. A Textbook of Neurology and Psychiatry. By Smith Ely Jelliffe, M.D., Ph.D., Adjunct Professor of Diseases of the Mind and Nervous System, New York Post-Graduate Medical School and Hospital, and William A. White, M.D., Superintendent of the Government Hospital for the Insane, Washington, D. C. Cloth. Price, $6 net. Pp. 796, with 341 illustrations. Philadelphia: Lea & Febiger, 1915.

This is a new textbook of neurology and psychiatry, not a mere verbal alteration of the old books. There are three divisions: Part 1 treats of the physicochemical systems (vegetative or visceral neurology); Part 2, the largest portion of the book, deals with sensorimotor neurology, and Part 3 is devoted to psychic or symbolic systems (neuroses and psychoses). The authors have demonstrated that with some effort it is possible not only to write in good literary style, but also to condense, for in most cases only one of these forms of writing is practiced. One may well call this an up-to-date text-book without violating the truth, for nothing in the recent literature seems to have escaped these vigilant seekers after the new. Indeed, one may even discover that which is made today and may be overthrown tomorrow; but we can easily overlook this anxiety to be modern, when for many years our new editions of older textbooks brought nothing that was not at least five years old. One of the best chapters in the book is that on the autonomic and sympathetic nervous systems and the internal secretions. It embodies everything worth knowing of that difficult theme from the physician's and student's point of view. The illustrations elucidating this part of the textbook have been taken from the recent monographs on the subject, and are excellent guides to a proper understanding of the theoretical and practical sides of the subject. The chapters dealing with methods of neurologic and mental examinations are modern

in every detail, though rather brief. They contain material which can be well elaborated by the teacher in the class room, after the student has mastered the bare outlines. Of other portions of the book we may emphasize the excellence of the chapter on syphilis of the nervous system, which contains almost everything known on diagnosis and therapy, including the Swift-Ellis treatment of late syphilis of the nervous system.

As both authors are distinctly and avowedly freudian in their tendencies, it was to be expected that freudian doctrines would find a prominent place among the neuroses and psychoses chapters of this book. It is remarkable, however, that both authors have been able to exercise self-restraint, for psychanalysis has not usurped too much space. With the clearness usual with the authors, the entire field of psychiatry has been set forth from kraepelinian concepts, slightly tinged with freudianism. This textbook may profitably be utilized by the thinking physician and the advanced medical student. Indeed, even the neurologist will find in it much that he has seen elsewhere, but not in such compact form.

On Pharmaco-Therapy and Preventive Inoculation Applied to Pneumonia in the African Native. With a Discourse on the Logical Methods Which Ought to be Employed in the Evaluation of Therapeutic Agents. By Sir Almroth E. Wright, M.D., F.R.S. Cloth. Price, $2 net. Pp. 118. New York: Paul B. Hoeber, 1915.

This book consists of a report to the Witwatersrand Native Labor Association on work undertaken under its auspices directed to the discovery of some method of mitigating the ravages of pneumonia among the native laborers in the Rand mines in South Africa. The material was published in the London *Lancet* in 1912 and 1914. The outstanding result of this investigation appears to be that the prevalence of pneumonia among the native workers in the Rand mines is to be ascribed to the bringing together in close contact in compounds of a population which has, as a racial character, a low resisting power to the pneumococcus, and that it is possible by means of prophylactic injection of pneumococci to increase greatly the resistance to pneumococcus infection and thus diminish the incidence and death rate from pneumonia among the native laborers. When the author says that in taking up experimental work on the phagocytobactericidal action of human blood with reference to pneumococci he is "breaking new ground," it shows that he is not familiar with the results of such work already recorded in medical literature. It must be regarded as unfortunate also that throughout all this work no consideration whatever is paid to the different groups of pneumococci as determined by immunologic reactions. All workers in this field will regret exceedingly that no information is vouchsafed as to the particular immunologic group to which belong the strain or strains of pneumococci used in the preparation of the vaccine employed in the prophylactic inoculation and in the other work to test the resistance of natives and others.

A Text-Book of Histology. By Rudolph Krause, A. O. Professor of Anatomy at the University of Berlin. Translated from an Original Manuscript and Printed Only in the English Language. Cloth. Price, $2.50. Pp. 274, with illustrations. New York: Rebman Company, 1915.

This textbook is a companion volume to the author's "Course in Normal Histology," to the illustrations in which the reader is constantly referred. Written by a man of real scientific eminence, with a creditable research record, the book has many unique features which should commend it to teachers. One notes with pleasure that the author recognizes the impossiblity of giving any structural definition to which all cells will conform, and the necessity of correlating the information gained in different fields of inquiry. It is one of the few books in which an attempt is made to establish a relation between histology and gross anatomy, on the one hand, and between histology and physiology, on the other. The absence of adequate illustrations is not wholly a disadvantage, when we reflect that histologic study is always carried on in presence of the material, and when we remember the baneful influence on the student's objectivity of the conventional caricatures which so commonly disfigure our textbooks on this subject. Such figures as are reproduced are new, or from the work of recognized authorities. Krause has made an honest attempt to present to students, as far as can be done in a book of this scope, the present status of the science, and throughout has enriched the text with facts and conclusions based on his own broad experience.

Index of Prognosis and End-Results of Treatment. By Various Authors. Edited by A. Rendle Short, M.D., B.S., B.Sc., Hunterian Professor, Royal College of Surgeons. Cloth. Price, $7. Pp. 570. New York: William Wood & Co., 1915.

This is a companion volume to the index of treatment and index of differential diagnosis produced by the same publishers. It represents essentially a compilation from the literature with careful editorial supervision. It is perhaps a correct presentation of medical efficiency at the time of publication. Numerous statistics are cited, and the results achieved in various localities are balanced one against the other in arriving at the status of results in various conditions. The various factors concerned in prognosis are considered under separate subheadings. The work presents, of course, chiefly the English point of view, although American literature has not been overlooked in compiling it. The book is marred by few didactic statements, though some do occur. For example, "No one who has been infected with syphilis in the past should be permitted to marry until his Wassermann reaction has proven to be negative," or the following: "Of the different functional tests the most valuable is the phenolsulphonephthalein test described by Rowntree and Geraghty. The simplest for the practitioner is the iodid of potash test." The price of the book would seem to be somewhat disproportionate to its evident cost of production.

Food—What It Is and Does. By Edith Greer. Cloth. Price, $1. Pp. 251, with illustrations. Boston: Ginn & Co., 1915.

This little book is intended as a school text, especially where cookery is not a school course. School instruction with regard to the nature, preparation and uses of foods serves a useful purpose, and an interesting and instructive book might be arranged to meet this need. Unfortunately the principles (whatever they were) that guided the selection and arrangement of material have produced a confused assemblage of facts. No fixed principles seem to have guided the selection of illustrations; some (as the full-page pictures of "Old Chinese Dishes," opp. p. 224 and "A Tea Tray," opp. p. 206) are irrelevant to the subject, while one ("Grinding Buckwheat," p. 23) would surely be misleading to children if not accompanied by further explanation. Altogether, the book seems praiseworthy as an earnest attempt rather than as a notably successful achievement.

Student's Text-Book of Hygiene. By W. James Wilson, M.D., D.Sc., D.P.H., Bacteriologist to the Counties of Down and Antrim. Cloth. Price, $2.50. Pp. 270, with illustrations. New York: Rebman Company, 1915.

While based on lectures given to the undergraduate class in hygiene in Queen's University, Belfast, and primarily intended for medical students, Dr. Wilson's book will also prove of interest to teachers, sanitary inspectors and others interested in public health. Though making no claim to originality, the book is a clear, concise summary of the best authorities on the various subjects included in modern hygiene. It is interestingly written, well printed and copiously illustrated.

Practical Oral Hygiene Prophylaxis and Pyorrhea Alveolaris. By Robin Adair, B.S., M.D., D.D.S., Professor of Oral Prophylaxis, Southern Dental College. Second Edition. Cloth. Price, $5. Pp. 462, with 121 illustrations. Atlanta, Ga.: Oral Hygiene Publishing Company, 1915.

Recent advances in dental science have encouraged the author to undertake the preparation of a new edition of this work. The book is practical, but is, of course, written with a special reference to the needs of the dentist rather than those of the physician. The author seems hardly prepared to accept the recent work on endamebas in pyorrhea, but places more reliance on the mechanical treatment. The book contains many new illustrations and several popular dental lectures.

Miscellany

A Community Sickness Survey

In 1912 and 1913, a study was conducted in Dutchess County, New York, by the State Charities Aid Association, to secure reliable data relative to sickness, nursing care and treatment among the general population. The period of study included all of 1912 and four months of 1913, and was made at the request of the Thomas Thompson Trust, an agency interested in the improvement of social conditions.

It was planned in this investigation to secure directly from families as full and accurate data as possible concerning sickness, including medical and nursing service obtained, the sufficiency, cost and need for domestic assistance in homes where sickness existed, etc. In Pamphlet 136 of the association, the results of this study are set forth and recommendations made for the improvement of existing conditions.

Many difficulties were encountered in carrying out the study in a satisfactory manner. During the sixteen months' period, 1,600 cases of sickness were found to have occurred, 786 of which were communicable, 673 were general medical and surgical cases, and 141 were obstetric cases. There were in addition 452 cases of chronic illness recorded, but for various reasons they are not considered in this study. Of the 1,600 patients, 1,217, or 76 per cent., secured medical care—1,058 in their homes, 101 in hospitals, fifty-eight both at home and in hospitals, and 383 patients remained at home without medical care. Of a total of 1,441 patients (90 per cent.) who remained in their homes during their entire sickness, 31, or 2 per cent., secured resident trained nursing service; fifty-three, or about 4 per cent., had visiting trained nursing service; seventy-seven, or 5 per cent., were cared for by resident untrained nurses, and twelve, or less than 1 per cent., by a visiting untrained nurse. In thirty-two homes (2 per cent.), resident domestic help was secured, and in one home visiting domestic help. In 852 instances (59 per cent.), some member of the family did whatever nursing was done.

According to the judgment of the investigators, only 55 per cent. of the 1,441 patients who remained in their homes throughout their sickness were cared for adequately; 44 per cent. received inadequate care. Only 80 per cent. of the hospital patients were cared for adequately; 20 per cent. were cared for inadequately, chiefly, it is said, because of the lack of social service and follow-up work. In many cases patients returned to homes unprepared for them, and proper convalescence was therefore impossible.

Combining home and hospital care, 57.5 per cent. of the patients were cared for adequately, and 42.5 per cent. inadequately. It was found that on account of lack of proper facilities, of 506 patients who could have paid for any necessary service, 81 per cent. were cared for adequately and 19 per cent. inadequately; 212 patients could not pay for medical or nursing service. Of these, 32 per cent. received adequate care and 68 per cent. inadequate care. It is said that in nearly 79 per cent. of the cases in which there was a lack of proper service, poverty was not a controlling cause. There were in most cases no facilities for service to be had, and in other cases there was lack of proper knowledge as to what service to seek and how to get it. Many other interesting facts were developed relative to this group of cases, which, it is believed, represent a fair average of conditions in like communities.

Dutchess County, it is said, is in rather better condition with respect to facilities for taking care of the sick than many others, and the figures emphasize the great necessity for improvement in these respects.

It is believed that the first thing necessary is to secure the cooperation of all existing agencies by organization into what the committee believes might properly take the form of a county health association. This might at first be a private organization, or might even remain so permanently, although from time to time many of its activities might be taken over by public agencies, as has happened in many instances.

In order to secure any results, it is said, the sympathetic interest and cooperation of the physicians of the county must underlie all work. To carry out the scheme proposed in the report of the committee would be a monumental undertaking at this stage of public opinion and education, and would require a large expenditure. The cost of securing the kind of service which the committee believes should be provided is not touched on in the report.

Mental Prophylaxis and Aftercare

One of the facts which emphasize the need for mental prophylaxis and aftercare of the insane is the large number of readmissions in hospitals for the insane. According to the government report "Insane and Feeble-Minded in Institutions, 1910," 23 per cent. of the 60,769 patients admitted to institutions for the insane in this country during 1910 had previously been in hospitals for the insane. As Dr. E. F. Leonard suggests in the *Institution Quarterly*, when the patient is discharged from hospital, he usually returns to the environment in which his mental disease developed and which perhaps aided in producing the disease. He has lost confidence in himself, is sensitive and feels doubly the suspicion and distrust which probably greet him as a discharged inmate of an insane hospital. Everything favors a relapse. The need for aftercare and of a friendly sympathetic oversight of such patients is evident.

As illustrating one phase of such aftercare, the same number of the *Institution Quarterly* prints an extract from the report of the Illinois Mental Hygiene Society, which has opened an industrial center in Chicago where work is to be given to convalescent mental patients. Here patients are taught handicraft; their products are placed on sale for their benefit. Some patients have been rendered partially, others wholly self-supporting. It is recorded of two patients that their whole attitude toward society changed because of the friendly interest shown in them; others have been improved in greater or less degree.

In most of the states in this country such work for the prevention of mental breakdown is either entirely neglected or left to private agencies. Several European countries, however, have a system of aftercare. In this country New York, Massachusetts, New Jersey, Rhode Island and Michigan are reported as doing some systematic work of this character. The *Institution Quarterly* also contains the plan of Dr. H. J. Smith of the Chicago State Hospital for an aftercare department to be maintained in connection with the state hospitals.

Medicolegal

Law and Evidence Applicable to Fracture Case

(*Dunman vs. Raney (Ark.), 176 S. W. R. 339*)

The Supreme Court of Arkansas affirms a judgment for $500, which plaintiff Raney obtained against defendant Dunman for alleged malpractice in the treatment of a broken leg. The court says that the injuries complained of were that the defendant, after setting the leg, so negligently and unskilfully treated and cared for it that it could not heal, but, on the contrary, became inflamed and diseased and the bones became dead so that the flesh did not adhere to them and the leg became so twisted, shortened, deformed, and diseased as to necessitate its amputation. The jury were instructed that, if the defendant failed to use reasonable care and diligence either in the diagnosis, treatment or the giving of instructions to the plaintiff or his attendants, and such failure resulted in the injuries to the plaintiff's leg, or any of them, of which he complained, without the fault of the plaintiff, it would be the duty of the jury to find for the plaintiff, and to assess his damages at such sum as, in the opinion of the jury, taking into consideration all the evidence in the case, would justly, fairly, and reasonably compensate him for such injury or injuries. Taking the instruction in connection with the allegations of the complaint, it could not have misled the jury, and it was not

abstract so far as furnishing the jury a guide by which to determine whether or not the injuries of which the plaintiff complained, or any of them, were caused through the defendant's negligence. The instruction was no broader than the allegations of the complaint, and the evidence on behalf of the plaintiff which went to the jury without objection warranted the instruction. It permitted the jury to find only for those injuries which the plaintiff did complain that resulted from the defendant's negligence. It was the duty of the defendant, if he conceived that the instruction permitted recovery for injuries not set up in the complaint, to call the court's attention to same by a specific request. The contention that the instruction was erroneous because it did not correctly define the elements constituting the measure of damages would have been well taken if this had been the only instruction on the subject. But a second instruction told the jury that they might take into consideration the plaintiff's loss of time, if any, resulting from the defendant's negligence, the plaintiff's loss of earning power, if any, the bodily pain and suffering which he had been compelled to endure, and mental anguish, if any, which had resulted from such negligence, and any future suffering or inconvenience which he must suffer by reason of such negligence, if any. The two instructions supplemented each other, and taken together, were a complete and accurate statement of the law. A physician or surgeon is not required to exercise the highest skill possible. He is bound only to possess and to exercise that degree of skill and learning ordinarily possessed and exercised by members of his profession in good standing, practicing in the same line and in the same general neighborhood or in similar localities. He must use reasonable care in the exercise of his skill and learning, and act according to his best judgment in the treatment of his patients. Nor was there error in a refusal to strike out the plaintiff's testimony that his leg got dislocated about a certain date. That was not exclusively a matter of expert or scientific knowledge. The plaintiff was competent to testify as to whether his limb was dislocated and out of shape after it had been set. Ordinary observation would discover whether a limb that had been properly set had been dislocated, especially where such dislocation was so marked as to cause the foot to be twisted and the limb to be in an abnormal position. Moreover, the plaintiff, who was enduring the pain and experiencing the ill effects from the broken limb, was certainly competent to testify that the leg, after being set, had become dislocated.

Sufficient Evidence of Fraudulent Diagnosis and Violation of Federal Law

(United States vs. Smith (U. S.), 222 Fed. R. 165)

The United States District Court for the Eastern District of Pennsylvania, in denying the defendant's motion for a new trial after he had been convicted of using the mails to defraud, says that the charge as presented in the indictment was a scheme or artifice to defraud within the meaning and the language of the acts of Congress on the subject. The scheme or artifice laid at the door of the defendant by the indictment consisted in representing to intended dupes that he was a physician professionally equipped and specially trained in the diagnosis and treatment of certain diseases and ailments. This, of course, was for the purpose of inspiring them with confidence in him and trust in his judgment of their condition. The scheme further contemplated that the persons thus approached should be invited to submit statements of symptoms to the defendant, and that, irrespective of what the symptoms indicated, whether health or disease, the defendant would dupe the patients into the belief that they were the victims of serious ailments and in dire need of medical attention, when in point of fact they were in normal health, and thus fraudulently induce them to part with their money for the defendant's benefit. It was enough if so much of the charge was proved as constituted an offense against the law, and the offense for the commission of which the defendant stood indicted. If the case involved, as counsel for the defendant assumed, nothing more than a difference of diagnosis, or of opinion as to the proper diagnosis, the position would be well taken that a mere difference of opinion offered no evidence in itself of any insincerity in any one of the opinions. The case presented against the defendant, however, was more than a difference of opinion. He was a physician. When the defense, as well as the case for the United States, was under the consideration of the jury, there was evidence of competency and experience as a medical practitioner. Moreover, whether there was knowledge or ignorance on the part of the defendant, the real question was the same. The evidence for the United States was full, and indeed unanswerable, that the symptoms which the defendant represented to his prospective patients as alarming evidence of disease were in fact no symptoms of disease at all, but of normal health. In point of fact, the symptoms set forth were the recognized symptoms of perfect health. This afforded the basis for the judgment of the jury as to whether or not, under all the evidence, the diagnosis made by the defendant was a fraudulent one. A finding of guilt was consistent with the view that, without knowledge of whether the symptoms were those of health or disease, the defendant, with the intent of fraudulent deception, meant to frighten the supposed patient into parting with his money. The finding was likewise consistent with the view that the defendant, being a physician, with a like purpose pretended the symptoms to be those of disease, when he knew them to be indicative of health.

Alcoholic Insanity as a Defense to Crime

(Cheadle vs. State (Okla.), 149 Pac. R. 919)

The Criminal Court of Appeals of Oklahoma holds that, in a prosecution for murder, alcoholic insanity, or mental incapacity produced by voluntary intoxication existing only temporarily at the time of the homicide, is no justification or excuse therefor. Drunkenness is one thing, and the disease of the mind to which drunkenness leads is a different thing. Temporary insanity, occasioned immediately by drunkenness, does not destroy responsibility for crime, where the defendant, when sane and responsible, voluntarily makes himself drunk. To constitute insanity, caused by intoxication, a defense in a trial for murder, it must be insanity caused by chronic alcoholism, and not a mere temporary mental condition.

The distinction between a fit of drunken frenzy or madness, commonly called "delirium tremens," and temporary delusional insanity, a disease caused by excessive and long-continued indulgence in alcoholic liquors, technically called "delirium tremens" or "mania a potu," is well defined by the authorities and text-writers. The principle is everywhere recognized that voluntary intoxication is no justification or excuse for crime, and is no excuse for homicide, though carried to the extent of producing incapacity to control the mind and will. However, while intoxication does not excuse homicide, it may produce a state of mind in which one is incapable of forming a design to take life; but evidence of intoxication is admissible only as bearing on the existence or nonexistence of malice.

Insanity, though superinduced by excessive and long-continued indulgence in alcoholic liquors, and known as "delirium tremens" or "mania a potu," renders a person so afflicted irresponsible for his acts, if it be of such a character as to deprive him of the mental capacity to distinguish between right and wrong, as applied to the particular act, whether he be under the influence of liquor at the time of the commission of the act or not; but, to do so, his affliction must be settled or fixed insanity, not a mere fit of drunkenness. A person, not previously laboring under such a disease or affliction, who voluntarily becomes intoxicated to such an extent or for such a period of time as to cause unconsciousness, of his acts, is not irresponsible under the law for the acts done by him while in such mental condition.

A person who commits a homicide while so drunk as to be incapable of forming a premeditated design to kill, if he had formed no purpose to commit the crime prior to the time he became so intoxicated, is not guilty of murder, but is guilty of manslaughter in the first degree.

Society Proceedings

COMING MEETINGS

American Association of Anatomists, Chicago, Dec. 27-29.
American Physiological Society, Boston, Dec. 27-30.
Society of American Bacteriologists, Urbana, Ill., Dec. 28-30.
Southern Surgical and Gynecological Association, Cincinnati, Dec. 14-16.
Western Surgical Association, Des Moines, Iowa, Dec. 17-18.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION

Forty-First Annual Meeting, held at Lexington, Ky., Oct. 19-21, 1915

The President, DR. HUGH CABOT, Boston, in the Chair

Arteriosclerosis of Uterine Vessels

DR. JOHN W. PRICE, Louisville, Ky.: A microscopic study of specimens I removed suggested that the hemorrhages were the result of rupture or sclerosed arterioles in the submucosa. Some areas beneath the submucosa contain recent hemorrhages undergoing fibrosis; other areas appear to be old hemorrhages which have undergone fibrosis, and in other places outside the vessels is evidence of repair. The patient had a single profuse hemorrhage three years before operation, and had no unusual bleeding during the following two years. The history of the case, the character of the hemorrhages, and the appearance of the patient are the greatest aid in making the diagnosis in the absence of a palpable tumor. In cases in which there is any doubt as to whether there is present a cancer of the body of the uterus, I suggest the use of the curet or hysterectomy. In cases in which the bleeding has been serious, no time should be lost in curetting —the uterus should be removed as quickly as possible, and if found to be malignant, a more radical operation can be performed at once. All my cases except the last one had been treated previously by so-called conservative methods. A continuance of a palliative treatment for too long a time subjects the patient to unnecessary danger, and if the patient is suffering with a malignant condition, much valuable time is lost.

DISCUSSION

DR. CHANNING W. BARRETT, Chicago: The uterus is an organ unlike other organs in that it has a physiologic hemorrhage, and any departure from that regular bleeding may be just a little change from the normal and the cause may be very slight. In weighing the different causes of hemorrhage, we must recognize that there is a material resistance to treatment owing to a change in the blood vessels themselves. Often coming on at about the menopause, we must remember that the uterus is a senile organ at that time. Instead of deciding that the uterus should come out if it is malignant, and ought to remain if it is not malignant, we should bear in mind that many of these uteri have to be removed at that time.

DR. THOMAS J. WATKINS, Chicago: As a remedy for temporary use in these cases, I would suggest an old but very efficient one, which consists in packing the uterus with gauze saturated with iron, Monsell's solution or the tincture. It is the only packing that can be left for a long time without becoming offensive. It can be left for a week without disturbing conditions or developing odors.

Kidney Lesions Diagnosed with the Aid of the Cystoscope and Roentgen Ray

DR. COURTNEY W. SHROPSHIRE and DR. CHARLES WATTERSON, Birmingham, Ala.: The cystoscopic examination and functional test, together with careful urinalysis, is by far the most important. Next comes the roentgenographic examination and then the physical findings and the patient's history. We place little faith on shadows said to be within the kidney or ureter unless they are shown positively to be within one of these structures by means of the shadow catheter, pelvic injection or the stereoscopic plate. Pelvic injection is one of the most valuable means for diagnosing lesions of the kidney. It is the duty of the cystoscopist to insist on those procedures which are safe and painless when properly performed before having numerous roentgenograms made which are worthless even though the suspicious shadows are shown.

DISCUSSION

DR. BRANSFORD LEWIS, St. Louis: The general practitioner should familiarize himself with the cystoscope and the urethroscope, because the proper application of these instruments will enable him to make a correct diagnosis. I have known a number of patients who have gone on for many years suffering because they were told by general practitioners that their trouble was practically incurable, yet their condition could have been relieved promptly by simple operative measures.

DR. F. M. BUCKMASTER, Effingham, Ill.: I recall the case of a woman who was operated on three times before the cause of her trouble was ascertained. She was about 30 years of age, and complained of recurrent attacks of pain, slightly continuous between times, along the lower end of the ureter in the appendiceal region. She also complained of attacks of cystitis. There was more or less urinary disturbance all the time, especially severe at times. The abdomen was opened and the appendix removed without relieving her symptoms. A year later, the symptoms continuing, the same surgeon opened the abdomen again, and removed a tube and ovary on that side. The cystitis and attacks continued. Three years after the first operation the symptoms not only continued but became worse, and at that time pus cells and blood cells were found in the urine, and the cystitis was quite severe a large part of the time. On investigation a stone was found in the lower end of the left ureter. This stone was removed and the woman recovered.

DR. LEON SOLOMON, Louisville: The Roentgen ray may or may not disclose the nature of the trouble, and I feel that sometimes it has been the cause of surgery that is difficult and might have been avoided. I have in mind a piece of surgery which was proposed by a careful diagnostician, himself an internist, in which the positive finding of the operation was that of a stone in the ureter. It was demonstrated in advance of the operation by the catheter in situ that the shadows were phleboliths.

Limitations of High Frequency Treatment of Papilloma of the Bladder

DR. H. G. HAMER, Indianapolis: Applications of the high frequency current in cases of carcinoma showed some hemostatic effect and slight reduction in the size of tumor or, on the other hand, marked reduction in size to be followed by rapid growth uncontrolled by burning. In one case it seemed to cause more rapid extention. High frequency cauterization is an important addition to our means of attacking vesical papillomas of the noninfiltrating type. All benign papillomas should be treated primarily with the high frequency current in view of the high percentage of recurrences following open operation (50 per cent.) and the high mortality (10 per cent.). In cases in which suprapubic operations have been done recurrences should be looked for and, if present, treated by fulguration on their first appearance. In dealing with papilloma involving the vesical orifice and prostatic urethra, perineal cystotomy with removal of as much of the tumor as possible, and application of the high frequency current to the remaining growth, seems a rational procedure.

DISCUSSION

DR. JOHN R. CAULK, St. Louis: The general practitioner should consider any bleeding from the urinary tract as serious, particularly a symptomless hematuria, and not stamp these hemorrhages as due to a congested bladder neck, and various other things that are so commonly ascribed as causative factors in these cases. The general surgeon has yet to be convinced of the importance of the cystoscope in almost all cases of prostatic hypertrophy before operation. Patients should be subjected to cystoscopy because of the fact that tumors quite frequently are back of prostatic obstructions, and many of the untoward results following perineal prostatectomy seem to be due to leaving behind a tumor which is back of the obstruction. I have seen four such cases.

Caudal Anesthesia for Prostatectomy and Other Genito-Urinary Surgery

DR. BRANSFORD LEWIS, St. Louis: This method of anesthesia was used in seventy-seven cases with gratifying results. The method is far preferable to the other methods.

DISCUSSION

DR. CHARLES E. BARNETT, Fort Wayne, Ind.: I think the mortality of prostatectomy is due more to general anesthesia than any other one thing, on account of the deficiency of the kidneys in these cases, and the sooner we can get away from general anesthesia, the less the mortality will be following prostatectomy, no matter what route we adopt in removing the prostate.

DR. JOHN W. DEAL, Springfield, Ill.: In speaking of the high mortality, I should like to ask whether reference is made to gas followed by ether or gas with the occasional administration of ether.

DR. RICHARD A. BARR, Nashville, Tenn.: Three years ago, Dr. Brown of Nashville noticed an account of this method of anesthesia in a German medical journal, and he immediately adopted its use. It has been quite generally used in our city since then by a number of surgeons doing rectal work. I have done a little rectal work and a few perineorrhaphies by the method, and have found it entirely satisfactory.

DR. FILIPP KREISSL, Chicago: The methods of local anesthesia for operations on the pelvis, bladder and prostate are intraspinal, epidural or sacral, and parasacral. The dangers of injecting the epidural canal with novocain or cocain, or the dangers of nerve blocking with novocain, are grossly exaggerated. If one will keep well within established and safe limits of this drug, not using more than a definite quantity of a certain concentration, there is absolutely no danger.

DR. STANLEY G. ZINKE, Richmond, Ky.: As to caudal anesthesia, the sacral canal is a cavity or sac, and we require from 30 to 90 c.c. of the agent we use before we get the anesthetic effect. Why? Because the capacity of these little sacs differ. The anesthesia is due entirely to pressure and not at all to the novocain present, 0.5 per cent. It makes no difference what quantity is injected, it is the pressure that does the work.

When Is a Prostatic Fit for Operative Procedure?

DR. CHARLES E. BARNETT, Fort Wayne, Ind.: After the maximum benefit from thorough preoperative treatment finds the patient below par in fitness for operative procedure, the question of the anesthetic given should be the most considered. The less the fitness, the less the general anesthetic. Local anesthesia when possible, and to the greatest degree when not possible is the one to be chosen.

DISCUSSION

DR. BEN MORGAN, Chicago: Local anesthesia in surgical operations on the prostate should come first in conjunction with a general but mild anesthetic, and what general anesthetic should be preferred? Chloroform? No. Ether? Doubtful. Nitrous oxid? Yes.

DR. W. D. HAINES, Cincinnati: The surgeon's duty, especially in this type of cases, is to save life, not time. The preoperative management of cases of prostatic disease is infinitely more important than what the surgeon is going to do at the operating table. It is not hard to take out the prostate; almost any general surgeon can do it; but the experienced man who has handled many cases will have a high mortality if he does not heed well the warning given us.

DR. J. B. TAULBEE, Lexington, Ky.: I am favorably impressed with nitrous oxid as an anesthetic. My experience with ether in doing prostatectomy has convinced me that in these cases in old men, in whom the system is run down, it is better to forego the operation than to risk a general anesthetic as ordinarily given, whether it is ether or chloroform. The safest method is to do a two-stage operation under local anesthesia.

Autogenous Vaccines in the Treatment of Bronchitis and Asthma

DR. ROBERT H. BABCOCK, Chicago: Autogenous vaccines prepared from the sputa have yielded such results in three cases of acute bronchitis, one of chronic bronchitis, and four of chronic bronchitis associated with attacks of spasmodic asthma as to warrant recommending this mode of therapy as against the old time use of expectorants by mouth. In bronchitis independent of asthma, the organisms have been mainly *Bacillus mucosus*, the *Diplococcus mucosus*, the *Micrococcus catarrhalis* and an influenzalike bacillus, while in cases of bronchial asthma an anaerobic fusiform bacillus has been added. Asthma has yielded to this vaccine treatment only when this anaerobic fusiform bacillus has been largely present in the vaccine. Great care should be exercised in the use of vaccines that the dosage be not so large or so often given as to cause reaction, since this reaction, whether general or local, indicates a negative phase and aggravates the patient's condition. The main drawback to the use of autogenous vaccines is the necessity of perhaps several cultures, and the preparation of new vaccines should the cultures show that some of the germs found originally have disappeared or become subordinate in number to others. New vaccines should be prepared whenever the condition of the patient seems to have come to a standstill.

DISCUSSION

DR. LEON SOLOMON, Louisville, Ky.: My experience with vaccines includes not only autogenous vaccines, but also the so-called stock vaccines. Their employment in properly selected cases is fraught with as many and as positive results as those obtained from the use of autogenous vaccines. The fusiform bacilli have been absent in every case under my observation, as well as that of a competent bacteriologist in a thoroughly equipped laboratory.

DR. R. H. BABCOCK, Chicago: One reason the fusiform bacilli are not more frequently obtained in culture is that this bacillus grows very slowly. My laboratory reports show that frequently after all other bacilli have put in an appearance the anaerobic bacilli will fail to become manifest until after the third and sometimes the fourth day. In cases of bronchial asthma, when an alveolar abscess is present in any given case, the cultures in that case will show two organisms, the *Streptococcus mucosus* and the anaerobic fusiform bacillus. I am not prepared to say that this is the organism which is responsible for the asthma; nevertheless it has been a striking experience in every one of my cases of alveolar abscess that, with one exception, a fusiform bacillus has been cultivated when the procedure has been allowed to extend over a sufficient length of time.

Typhus Fever

DR. RICHARD P. STRONG, Boston: The epidemic of this disease which recently raged in Serbia was the most severe one which has occurred in modern times. A few cases of typhus had occurred in Serbia in October, 1914, but the disease did not make its appearance in epidemic form until January, 1915, and then in the northwestern part of the country, among the Austrian prisoners, who were greatly crowded and who necessarily were compelled to live under very insanitary conditions. The disease quickly spread from them to other individuals, and as the infected patients and the districts in which they were situated were not quarantined, and the Austrian prisoners and infected individuals were sent or allowed to go to various parts of the country, Serbia was soon afflicted with a terrible and widespread epidemic. The country, weakened by war, was not prepared for an epidemic, and for a time one might say that the typhus raged almost at will. The majority of the small number of Serbian doctors sooner or later became afflicted with the disease. Those who remained well were occupied with treating the sick and also the wounded from the battlefields, and methods for prevention were impracticable or were not undertaken. Wounded soldiers, or those afflicted with minor ailments or diseases with relapsing fever, wandered into the hospitals at will and entered the wards filled with cases of

typhus, sometimes occupying the same bed, for it was not unusual for two or even three patients to be found lying in the same bed, and the available floor space was also filled with patients with no beds. The epidemic increased through January, rose more rapidly in February and March, and reached its height in April, when the number of cases was in the neighborhood of 9,000 a day. Through the combined efforts of all the outside volunteer workers, and with the cooperation of the Serbian physicians and officials, the epidemic rapidly declined, and for the last three weeks before my departure from Serbia we could not find a fresh case of typhus. The sanitary condition of the army and the people was then excellent. I trust that the sanitary demonstrations in the prevention of typhus, which have been given the Serbian people, and the construction of the various disinfecting plants throughout the country will prevent the occurrence of another epidemic of typhus, such as we have just witnessed, and which destroyed in the neighborhood of 150,000 people. All of the Serbian hospitals had been thoroughly disinfected before I left that country, and are ready for the reception of the wounded.

Gastric and Duodenal Ulcer from the Standpoint of the Internist

DR. W. F. BOGGESS, Louisville, Ky.: I would urge that the internist be more careful and painstaking in his examination of the various digestive disturbances that come to him, to fit himself to recognize these conditions in their earlier stages, and to urge on him the fact that there is a medical side to the question, and that if the majority of these patients go to the surgeon it is a reflection on the internist's diagnostic as well as therapeutic acumen. When do these cases cease to be medical and become surgical? No time limit can be stated. Each case is an individual one. When all medical means have been intelligently tried, and one is threatened with a condition of chronic invalidism, then call a surgeon with the assurance that he can and will restore the patient to a fair, if not perfect, condition of health and happiness.

(To be continued)

MEDICAL ASSOCIATION OF THE SOUTHWEST

Tenth Annual Meeting, held at Oklahoma City, Oct. 12-13, 1915

(Concluded from page 1845)

Management of Pellagra

DR. W. T. WILSON, Navasota, Texas: A valuable test of pellagra in case of doubt is to expose the bare arms to the sun for an hour for two or three days, and if the person is a pellagrin the characteristic eruption usually appears. In acute pellagra, or in pellagra of recent origin, picric acid is of value internally and as a gargle. In severe cases or those with malarial symptoms, quinin hypodermically should be used first, the picric acid following. In the chronic forms, picric acid and sodium cacodylate may be alternated or given at the same time, and also some sodium bicarbonate at intervals.

An Outline of the Progress of Prostatic Surgery

DR. CLARENCE CAPELL, Kansas City, Mo.: There has been progress in prostatic surgery. The mortality has been reduced from about 15 to about 7 per cent. This progress has been along several lines. In the first place we have a better knowledge of the anatomy and mechanics of the condition. We know now that in only about 90 per cent. of the cases is there present a true hypertrophy of the prostate. There may be a fibrous bar across the floor of the bladder near its outlet, or there may be a fibrous infiltration entirely surrounding the internal meatus. The word "prostatism" is the better word to designate the condition. Another advancement is the more thorough preliminary examination and investigation of the cases. I should like to emphasize the value of the cystoscope and functional kidney tests. When the kidney function is low the mortality is high, and when the kidney function is high the mortality is low. Another advancement is in the improvement in the operative technic. The suprapubic is fast becoming the more popular route, as it enables the operation to be done more easily. There is less likelihood of doing injury to the rectum and other structures. There is less likelihood of its resulting in lack of urinary control or of there being a permanent urinary fistula. It is true that the mortality is a little higher, but the results are so much better that if there are no special indications for the perineal operation, the suprapubic should be the route of choice.

DISCUSSION

DR. A. B. SMALL, Dallas, Texas: My experience in doing prostatectomy is that the suprapubic route is much preferable to the perineal, and if I were doing this work now I should do it under caudal anesthesia.

DR. JOHN A. WALKER, Shawnee, Okla.: It is essential to get patients on whom we are to do a prostatectomy in the best possible condition before the operation. In the old men with enlarged prostates in whom the catheter has been used from three to ten years, the walls of the bladder are enormously enlarged, thickened, congested and stretched out of shape and out of the normal relations that they ought to have. The operation should be done in two stages, first opening the bladder suprapubically, and inserting a large drainage tube, and then later enucleating the gland.

DR. J. M. COOPER, Enid, Okla.: It has been my observation that when a patient has been accustomed to the use of the catheter for a number of years, the suprapubic route is preferable. The urethra is more or less infected, there is a large amount of congestion, and in some cases the walls of the urethra will be hardened, and in such cases you will not get the urethra to heal readily after the operation.

DR. F. H. CLARK, El Reno, Okla.: I have always resorted to the perineal route in removing the prostate, and have not had any difficulty in doing so. I think we obviate the two stage operation by so doing.

DR. J. E. GILCREEST, Gainesville, Texas: We should get these patients in readiness for operation and try to get the bladder thoroughly drained suprapubically before removing the prostate. I did a suprapubic prostatectomy in one case, but in the last twelve years I have done nothing but the perineal operation.

DR. T. M. SANGER, Oklahoma City: In nine tenths of these bladder cases, the operation should be performed at one sitting. I have learned from experience that if free drainage of the bladder is kept up, there will be very little trouble from infection. In one case, before operation the patient was passing stones because there was so much sediment in the urine, but as long as I kept the drainage tract open there were no further infection, no fever, and no trouble.

Catarrhal Deafness, with Special Reference to a New Method of Treatment

DR. W. E. DIXON, Oklahoma City: After recovery from all throat and nose operations, and especially secretions in the nasopharynx, I pass an applicator wound with cotton which has been dipped in a 5 per cent. solution of cocain and epinephrin in one tube, and immediately follow this by another dipped in a 1 or 2 per cent. solution of silver nitrate. The next day the other tube is treated in a like manner. This mode of treatment is continued until the hearing is improved or until the tubes are patent. I have treated each tube every day, but better results are obtained, perhaps, by not treating so often. It may be better, after the first week or two of treatment, to treat each tube only twice a week, then once a week. Finally the patient will tell you that the air passes freely, at which time it is best to lengthen the interim between treatments.

Treatment of Nevus

DR. J. L. MCDERMOTT, Kansas City, Mo.: Treatment should be instituted as soon after birth as the strength and health of the baby will permit, especially in those nevi which manifest a tendency to grow. If properly treated, the growth will be checked at once and its complete removal will be facilitated. As to the method of treatment, that will depend on the age of the patient, the location of growth, the size and character of the growth, and the ability of the doctor to keep his

patient under observation and control for the necessary time to complete the treatment. In recent years the use of Roentgen and radium therapy has grown in popularity in the treatment of nevus. Both agents have a specific and selective action on the endothelial cells of the vessel walls, and produce an endarteritis followed by a fibrosis. Successive treatment causes the fibrous tissue to undergo contraction, and the vessels are largely obliterated. How perfect the results of the treatment are will depend on the operator's ability to destroy the subcutaneous vessels, and at the same time preserve the surface epithelium. In papillary angiomas and small localized nevi, excellent results may be secured with carbon dioxid snow. Even in cavernous angiomas in which spontaneous hemorrhages have occurred, the snow may be used without danger of hemorrhage following the treatment. In the application of snow, caution should be used in the depth of the freezing produced, for, as in any other form of treatment, an ugly scar may result if due care is not used.

DISCUSSION

DR. E. H. SKINNER, Kansas City, Mo.: I have not had success with radium in treating port wine marks, but I think all of the work that has been done with radium in lymphangiomas can be duplicated by the Roentgen ray. There is a tendency at the present time on the part of people to take advantage of radium, which not all of us can afford to keep in our offices, and as long as the same results can be obtained by means of the Roentgen ray, except in cases of port wine marks, it is unnecessary to advise patients that radium is the only treatment.

Nervous Disorders Associated with Pelvic Disorders

DR. G. H. MOODY, San Antonio, Texas: Any pelvic disease should be corrected, if possible, just as should any disease of any other organ of the body without reference to the question as to whether or not a nervous or mental disorder exists in order to stop its drain on the general health, provided in a neurotic individual, when a surgical operation or other heroic treatment is indicated, the nervous depression or instability is not so great as to precipitate an acute outbreak as often happens. Several cases have come under my observation in which nervous and run-down women have become abruptly insane immediately following an operation, well performed, and in good surgical hands. A few patients also have been operated on under my observation during an attack of insanity, neurasthenia or hysteria with the results of an intensification of the nervous symptoms, induced by the extra strain and shock made by the operation and anesthetic on an already depressed nervous system. I have also seen more or less important operations, made on a diseased pelvic organ in an excited, delirious or maniacal patient, result in marked improvement, when the operation was followed by the patient being put to bed and absolute rest enforced. The same immediate improvement has also been observed in others, men as well as women, not requiring an operation, when absolute rest and proper care and attention were likewise enforced.

DISCUSSION

DR. G. W. ROBINSON, Kansas City, Mo.: If the pelvic organs are diseased in nervous women, they should be treated just the same as they would be in those who are not nervous. The same changes take place in the nerve cells, as the result of constant pain, which occur in cases the result of shock. We also get a state of intoxication because in these conditions the body is not able to take care of toxins that normally develop in the system, and naturally we would expect neurologic conditions to develop as the result of pain extending over a long time. Especially do we have infections in the pelvis from which we get an absorption of toxic material.

DR. S. GROVER BURNETT, Kansas City, Mo.: I know of no question more difficult to answer than when we shall remove pathologic conditions in the pelvis in a patient who has gone to pieces mentally. When there is unmistakable disease in the pelvis that is doing damage to the patient, it should be removed; but there has been too much removal in women for so-called neurotic ovaries. Surgery is contraindicated in such cases.

Nitrous Oxid-Oxygen Analgesia in Obstetrics

DR. F. K. CAMP, Oklahoma City: The time of labor is materially shortened. Perineal lacerations are less frequent. In forty-four primiparas to whom gas was given, twenty showed some degree of laceration, or 45 per cent., while with sixteen primiparas without gas, there was some degree of laceration in twelve cases, or 75 per cent. In my series of twenty-five cases, all of the babies cried just as early and just as vigorously as those who did not receive the gas, and showed no signs of anesthesia. The convalescence in these patients was in every way smoother and quicker than I have ever seen in a corresponding series of cases. More patients left the hospital under ten days after delivery, than over twelve. Multiparas were generally out of bed on the fifth day, primiparas up in a chair on the sixth or seventh day.

DISCUSSION

DR. S. J. WOLFERMANN, Fort Smith, Ark.: I should like to report a fatal case in a member of my own family. The patient, aged 32, was given nitrous oxid gas in New York by one of the best anesthetists there for the purpose of undergoing an operation for a peritonsillar abscess, and died in a minute and a half from respiratory failure.

Diagnosis and Medical Treatment of Gastroduodenitis

DR. F. B. ERWIN, Wellston, Okla.: The nervous phenomena in these cases are so very prominent that many have at first been diagnosed hysteria, neurasthenia and other nervous diseases. They have even been diagnosed as gallstones. The patient complains of general weakness, occipital headache, hot flashes, numbness of limbs, nausea with occasional vomiting, disturbance of vision, pain in region of stomach and duodenum, in from one to two hours after eating, belching considerable quantities of gas, palpitation of the heart and many other similar symptoms. On physical examination the patient frequently presents a pale, rather sallow, listless expression; the heart action in the incipient stage is usually in fairly good condition, with the exception of being easily irritated; some tenderness in the region of the stomach and duodenum; kidney action increased at the time of attacks of pain; increased acidity of the urine; bowels in the first few months usually constipated; blood pressure slightly lowered, and the superficial reflexes increased considerably and the deep reflexes slightly. The treatment of these cases is largely dietetic, with a small amount of medicine the first few weeks. The medicinal treatment should be so adjusted as to check and change the too acid condition of the stomach and return it to a normal condition. A mild alkaline preparation should be given every two or three hours for a few days. At the same time strychnin should be given three or four times daily. A gentle laxative should be used from every two to four nights. No severe purgative should be prescribed at any time, for the reason that it irritates and aggravates this condition. Strychnin has an excellent tonic action on the muscular striae of the intestinal wall when given three or four times a day. It also has a good tonic effect on the heart. The length of time for medicinal treatment will depend on the stage of the disease and the reactive power of the patient. The diet should consist largely of carbohydrates and fats so as to place as little work as possible on the stomach and duodenum. It should be taken every three or four hours for a time in small quantities. Such food as cream, butter fat, toasted light bread and like foods are easily digested. No fried foods or acid should be allowed at all.

Tracheobronchoscopy and Esophagoscopy

DR. D. L. SHUMATE, Kansas City, Mo.: I have done all my work through the mouth, not finding it necessary to do a tracheotomy. Under general anesthetic, I use a dorsal position, with the patient's head held off the table by an assistant. I have found that the quicker you operate, the better the condition of the patient and the easier to remove the foreign body. I have two cases of safety pin in the esophagus, one in a grown woman, the other in a 7-months-old baby. A case of a 25-cent piece in the middle third of the esophagus, I failed to find the first time I tried, but got it on second trial.

One half-dollar that I saw disappear into the stomach under anesthesia in a 6-year-old boy was passed in the stool five days afterward. I saw one peach seed do the same trick, except that it passed from the esophagus before the patient had entirely lost consciousness from the anesthetic, but was unable to tell us until afterward. Of course I failed to find the seed, for it was no longer in the esophagus. I have had cases of big buttons, little buttons, a buttonhook, a plum seed, pieces of tin and many foreign bodies in the esophagus. I have had thirty-odd cases all together, and I feel that I have only begun to acquire the skill and knowledge of doing good work. I have had only two deaths.

NEW YORK ACADEMY OF MEDICINE

Meeting held Oct. 21, 1915

The President, DR. WALTER B. JAMES, in the Chair

SYMPOSIUM ON TYPHUS FEVER

The Form of Typhus Fever that Is Endemic in New York and Has Been Called Brill's Disease

DR. NATHAN E. BRILL: Typhus fever is always the result of conditions which are associated with personal filth, with the segregation of people in confined quarters, and with economic conditions which produce squalor and famine; finally, it stands as an index of man's greed, of his lust of conquest, of his sociologic inefficiency. In short, the disease appears whenever conditions are favorable to the development of vermin, particularly the body louse, with which the disease is now specially associated as an etiologic factor. The body louse explains most of the epidemiologic factors of the disease, particularly its appearance and its spread. Typhus fever has appeared in all countries, particularly in those in which the social conditions are associated with poverty. Even America had not been spared in the past, as is evidenced by its occurrence in 1836, 1847, 1865, 1881 and 1893. With the last two epidemics I have had personal experience in New York. In order to form a proper conception of the disease, it will be necessary to divest the mind of all preconceived notions gained from textbooks and monographs. Typhus fever exists in two forms, a mild, attenuated or endemic form, so disguised as to have escaped observation and to have been mistaken by almost everybody for typhoid fever, and the epidemic form which usually begins rather suddenly with a chill or chilly sensations, though it may occasionally be preceded by two or three days of malaise and general body pains. Headache rapidly supervenes and fever immediately appears. These symptoms ars quickly augmented, so that by the second or third day the fever may have reached its fastigium of 104 or 105 F. As the disease progresses it is marked by profound toxemia, signs of intense blood infection, marked involvement of the nervous system manifested by delirium, excitement and tremor, and somnolence, stupor, coma vigil, and an unusually severe involvement of the muscular system as well, with the tremor and physical exhaustion which were so often manifested. Epidemic typhus fever is a disease of the winter months and is highly communicable. Wherein does the endemic or mild form of typhus fever differ from the epidemic typhus fever? The two are alike in their onset, in the first stage of the eruption, in the critical decline and both are terminated, not followed, by relapses. In all other respects they differ. The eruption in the mild form rarely goes to the hemorrhagic stage; it is always an erythema. There is no profound involvement of the nervous system; there may be a slight delirium, but it is mild in type, appearing only at night. The patient is never, or rarely, stuporous, never seized by maniacal excitement, never goes into coma vigil, and has no muscular tremors, subsultus, or carphology. Involuntary discharge of urine and feces has never been seen by me in the mild form of typhus fever. In the mild form the headache, instead of diminishing about the eighth day as in the epidemic form of the disease, becomes progressively more intense even up to the end of the illness. The mortality of the mild form is less than 0.25 per cent. I have seen only one death in over 400 cases which up to this time have been entered on our records at Mount Sinai Hospital. This is a marked contrast to the mortality of 20 per cent. in the hospital cases of epidemic typhus fever seen by Murchison and Curschmann. The period of the greatest prevalence of the mild form is in the summer months, which is directly opposed to the time of prevalence of the epidemic form. In the mild form a little less than 70 per cent. of all the cases appear in the months of July, August, September and October. There is a decided difference in the communicability of the two forms, the endemic form showing no evidence of being at all communicable. It seems to me that the body louse is not an important factor in the communicability of the mild form of this disease, and that some other agent must be looked for to explain the origin and spread of this form. It was the epoch-making work of Dr. Harry Plotz, who isolated the organism of the mild form and of the epidemic form of this disease, which he found to be identical in all respects, which proved that the disease which I described was typhus fever. I am thoroughly convinced that the work of Dr. Plotz and Dr. Peter K. Olitsky has established the etiologic factor of typhus fever in its two forms, and that this dread disease is no longer one of unknown origin but is due to the invasion of the body by the *Bacillus typhi exanthematici.*

Typhus Fever in Mexico, in England and in This Country

DR. JOHN F. ANDERSON, Washington, D. C.: Typhus fever in England, in Mexico and in the United States, so far as my observations go, shows no essential differences, except as regards severity and mortality. The disease as it came under my observation in England had a mortality of about 20 per cent.; the mortality in America is not over 2 per cent. The mortality in Mexico shows considerable variation in different years and among the native and foreign population. In 1909 and 1910, the mortality among the patients in the Mexican General Hospital was 10 per cent., while in 1911 and 1912 it was nearer 5 per cent. The disease is much more severe among the foreign population than among the natives. Of 144 cases of typhus fever treated in the American Hospital in Mexico City from 1888 to 1910, fifty died, a mortality of 34 per cent. Many mild cases escape observation, while the severer cases are seen by a physician, and in this way the mortality rate is increased over the true figure. In the western hemisphere typhus fever occurs in a mild type in practically all the larger cities as far west as Milwaukee and as far south as Atlanta. It also occurs in certain portions of Mexico and Central America. In Mexico it has been observed that it never prevails below an elevation of five or six thousand feet. Even when persons come from a high altitude during the incubation period of the disease and develop the disease after reaching the coast, it does not spread. The inability of typhus fever to spread in the lower altitudes of tropical and subtropical countries and its lessened prevalence in summer and fall is attributed to the effect of the higher temperature on the transmitting insect, the body louse or *Pediculus vestimenti.* Since we know that typhus fever is transmitted by the body louse and know the effect of high temperature on the life of the insect, we can explain the influence of the high temperature on the prevalence of the disease. Typhus fever is still endemic, and the United States should require American sanitarians to recognize the persistence of the problem and to guard against a disease that may at any time assume epidemic prevalence and virulence. All efforts at prevention must be centered on the louse. These should include measures for the destruction of all lice and their eggs, the adoption by persons in the vicinity of cases of typhus of measures to prevent the possibility of their being bitten by lice, and inoculation with the mild type of the disease of persons entering localities where the disease is present.

Pathogenesis of Typhus Fever

DR. PETER K. OLITSKY: The organism of typhus fever is a small gram-positive bacillus which grows only under anaerobic conditions. It is found in 100 per cent. of the

epidemic typhus cases in which cultures were made before the crisis and in 53 per cent. of the endemic cases. The earlier in the disease the blood culture is taken the more often it is positive. The more severe the case, the more numerous are the organisms. Antibodies against the organisms are found in the blood of typhus fever patients or in animals in which the disease has been produced experimentally. Complement-fixing bodies, agglutinins, precipitins and opsonins have also been found. These antibodies are usually absent when the fever is present, and are present to a small extent at or shortly after the crisis. The greatest concentration is found from five to twelve days after the crisis. The crisis is not due to sudden destruction of the bacteria, but rather to the result of the activities of the cells. Complement-fixation tests are positive in 71 per cent. of the cases after the crisis. They are negative when tests are made with the serum of patients suffering from other diseases or with the serum of typhus fever cases tested against other organisms. Agglutinins were present in 92 per cent. of the cases after the crisis. In numerous control cases no agglutinins were found. Precipitins were found in 73 per cent. of the cases after the crisis. In monkeys with experimental typhus fever, antibodies were found the same as in man. In guinea-pigs only opsonins were found. In cases of endemic typhus the most marked antibody reactions were found in cases with negative blood cultures. Antibodies could be produced in a few monkeys by inoculation of the organism, but they were not immune to the virus of typhus fever. It was found that blood from typhus fever patients which contained no bacilli or very few was not infective for animals, while typhus blood in which the bacilli were more numerous was infective for animals. Finally, we have succeeded in finding a febrile reaction like that in typhus fever by injecting a guinea-pig with an emulsion of live typhus bacilli from a case of endemic typhus fever. In one guinea-pig the organism was recovered from the blood at the height of the febrile reaction.

Discussion on Typhus Fever

Dr. G. A. Friedman: Three epidemics of typhus fever came under my observation while I was in active practice in western Russia. The disease was constantly endemic and ran a mild course. If an epidemic occurs in a locality in which typhus fever has not recently been present, the cause is an exogenous one. In such a community the epidemic spreads more rapidly than in a community in which outbreaks occur at frequent intervals. These cases run a more severe course, and the mortality is higher. An epidemic breaks out with few exceptions in the fall, reaches its height in February or March, and dies out with the first warm days. Somehow there is a tendency for the contagion to remain in endemic form in many regions of the world in an attenuated state. From these endemic cases an epidemic may be expected at any time. It is impossible to state why the endemic cases do not more frequently lead to epidemics in the overcrowded dwellings of our large cities. In endemic regions one sees cases of typhus fever at all seasons of the year, though in the fall and winter the moderately severe cases are more numerous, while in the spring and summer the mild cases predominate. As a rule, the course of the disease is mild among children even in epidemics.

Dr. E. Libman: Dr. Brill did not mention two cases of endemic typhus fever in which he made necropsies and found the bone marrow of the femur red. This feature was first noticed by Dr. Welch, who has expressed the view that possibly the organisms multiply in the bone marrow. The suspicions that have been expressed that the organism of Dr. Plotz may be a secondary invader can easily be dismissed. We know of no disease that has a constant secondary invader. The organism described by Drs. Plotz, Baehr and Olitsky was found regularly in the blood of epidemic typhus fever cases and in half the cases of endemic typhus fever. The organisms from the epidemic cases were found to be virulent; those from the endemic cases were not. I should like to call attention to the part of the work done by Dr. Olitsky in which he finds in the endemic cases of typhus fever the most marked complement-fixation and agglutination reactions in the twenty cases that had negative blood cultures. Cultures were made in most of those cases within five days before the crisis. As the organism was not in the blood at the time, it is evident that it was either in the blood before that time or was in the organs; otherwise reactions would not have been obtained against the organism. This is definite proof that the organism cannot be considered a secondary invader. I have just received a letter from Dr. Baehr in which he states that the blood cultures in the very first two cases of typhus fever which he and Dr. Plotz studied in Belgrade showed the typhus bacillus. The blood culture from the first case was taken on the fifth day and showed a larger number of organisms than that of any case so far studied. This is an additional proof that the bacteremia is more marked early than late. Probably the investigators who have been studying typhus fever in Serbia did not find the organism in any number of cases because the serum which they used was not favorable to the growth of the organism. As to immunization, it seems to me that it would be best before adopting the method suggested by Anderson, namely, injecting a patient with the virus of the disease, to try the injection of dead bacilli, then of sensitized living bacilli, and, finally, if it should be found necessary, small numbers of live bacilli from the endemic cases, these bacilli not being virulent. The experiments of Dr. Anderson are interesting, but it must be noted that his inoculations were all made intraperitoneally. Apart from that, the organisms used by Dr. Anderson were not virulent, and, again, from the results of immunity experiments on animals one can draw no binding conclusions as regards the efficiency of vaccination in human beings. Our best course will be to take the advice of Leishmann in connection with typhoid fever, to make a careful study in human beings.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

October, LXXII, No. 2, pp. 223-426

1 Study of Eugenic Forces. A. J. Rosanoff, Kings Park, N. Y.
2 Case of Retro-Anterograde Amnesia Following Gas Poisoning. P. C. Knapp, Boston.
3 Study in Social Maladjustment. H. B. Moyle, Brookline.
4 Paraphrenia Erotica. M. J. Karpas, New York.
5 Psychoses of High Imbecile. H. J. Berkley, Baltimore.
6 Some of More Recent Problems Connected with State Care of Insane. J. V. May, Albany, N. Y.
7 Value of Routine Laboratory Work in Psychiatry. P. G. Weston and I. Darling, Warren, Pa.
8 Institutional Stasis. H. C. Eyman, Massillon, Ohio.
9 Therapeutic and Economic Value of Diversional Occupation. B. D. Evans and F. M. Mikels, Morris Plains, N. J.
10 Voice in Tabes—Voice Sign. W. B. Swift, Boston.
11 Treatment of Paresis and Tabes Dorsalis by Salvarsanized Serum. (To be continued.) H. A. Cotton, Trenton, N. J.

American Journal of Medical Sciences, Philadelphia

November, CL, No. 5, pp. 625-780

12 *Roentgen Diagnosis of Gastric Cancer; Report of Twelve Cases. R. D. Carman, Rochester, Minn.
13 Significance of Acro-Ataxia and Proximo-Ataxia. C. F. Hoover, Cleveland.
14 *Studies of Nephritis. H. A. Christian, C. Frothingham, Jr., J. P. O'Hare and A. C. Woods, Boston.
15 Studies in Moniliasis of Digestive Tract in Porto Rico. B. K. Ashford, U. S. Army.
16 Occurrence of Sprue in United States. E. J. Wood, Wilmington, N. C.
17 *Gangrene of Lung. G. D. Head, Minneapolis.
18 *Luetin Reaction in Diagnosis of Tertiary and Latent Syphilis. F. M. Hanes, Richmond, Va.
19 *Friedländer Bacillus Pneumonia; Report of Cases. W. R. Sisson and C. B. Thompson, Boston.
20 *Elimination of Acetone and Diacetic Acid in Two Hundred and Fourteen Surgical Cases. M. R. Bradner and S. P. Reimann, Philadelphia.
21 Luetic Arthropathies. W. H. Higgins, Richmond, Va.

12. **Roentgen Diagnosis of Gastric Cancer.**—The records of the Mayo clinic, according to Carman, show that in a large series of cases confirmed by operation, 67 per cent. of the patients had palpable tumors and 53.3 per cent. had food remnants. In other words, 33 per cent. had no palpable tumors and 46.7 per cent. had no food remnants to indicate obstruction. It is precisely in those cases, says Carman, which show neither tumor nor food remnants, that the Roentgen rays have their greatest field of usefulness and superiority. It is no longer necessary to wait until the tumor is palpable or until evidences of marked obstruction exist. He does not say that the clinical data should be discarded. On the contrary, the roentgenologist should in every instance be acquainted with the clinical facts. If suggestive of cancer, they will stimulate him to a more exhaustive search. If negative, they will exercise a wholesome restraint on his interpretation of the reflex phenomena so often produced by conditions outside the stomach. More important still, the final diagnosis should be compatible with all the findings, if possible, and occasionally only their correlation will make the diagnosis. A combination of all methods forms a net through which few cancers will escape.

The roentgenologic manifestations of gastric cancer include departures from the normal contour, pyloric action, peristalsis, motility, flexibility, mobility, position and size of the stomach. Enumerated in the order of their relative importance, these signs are: 1. Filling defects. 2. Alterations of pyloric function: (*a*) gaping of the pylorus; (*b*) obstruction of the pylorus. 3. Perversion of peristalsis: (*a*) absence of peristalsis from involved areas; (*b*) weak peristalsis; (*c*) antiperistalsis; (*d*) exaggerated peristalsis; (*e*) irregular peristalsis. 4. Altered motility: (*a*) rapid and early emptying (nonobstructive cases); (*b*) delayed emptying (obstructive cases). 5. Lessened flexibility. 6. Lessened mobility. 7. Diminished size (capacity). 8. Displacement. Roentgenologic determination of the absence or presence of obstruction, its site and degree, aids materially in judging the advisability of palliative surgery and in selecting the operation, whether gastro-enterostomy or gastrostomy, or jejunostomy. In expressing any opinion as to operability, unless the cardia or upper media is definitely implicated, or unless the growth is extraordinarily extensive, the roentgenologist should be chary of saying that a case is inoperable, as he may thus deprive the patient of relief or cure at the hands of the surgeon. In the majority of instances exploration alone is the final word and the patient should be given the benefit of the doubt.

14. **Nephritis.**—The authors summarize the results of their extensive study as follows: A. Test renal meals in relation to renal function. 1. Of two general methods used the v. Monakow standard diet with days of added salt or urea and the Hedinger and Schlayer test day on a mixed diet, the first requires about ten days of hospital study and the second three days. Using the two methods on a series of patients the authors have obtained similar results by each. 2. Though similar, the results are not quantitatively identical. The same is true for the same test repeated several times on the same patient. 3. For the Hedinger and Schlayer test there is no constant normal curve of excretion. Normality consists in the ability to vary from period to period the amounts and concentration of the substances quantitated. Abnormality consists in a more or less marked degree of fixation in all of these values from period to period. 4. Fixation in excretion of nitrogen seems to develop at a later period in most cases than is true for water and salt.

B. Quantitative studies of nonprotein nitrogenous bodies of the blood. 1. Urea nitrogen in a series of cases averaged 63.4 per cent. of the total nonprotein nitrogen of the blood, and its increase was usually proportionate to the increase of the total nonprotein nitrogen. 2. Ammonia nitrogen increased slightly but not proportionately. The same held for uric acid and amino-acid nitrogen. 3. Creatinin showed roughly a proportionate increase. 4. The difference between determined forms of nitrogen and total nonprotein nitrogen was greatest in cases with clinically most severe symptoms. 5. In the spinal fluid the increase in nitrogen is almost solely in urea nitrogen except in cases of anuria. 6. The authors can see no advantage in quantitating the nitrogen of the spinal fluid over quantitating it in the blood. 7. No relationship existed between the amount of nonprotein nitrogen in the blood and changes in the retina.

C. Diuresis in relation to diuretics. 1. Diuresis is relatively infrequent in the average hospital patient. 2. Except for diuresis in cardiac cases following digitalis, diuresis bears an inconstant relation to diuretic drugs. 3. In cases of nephritis with or without edema and without cardiac decompensation, diuretic drugs often fail to produce a striking diuresis. Their observations justify a healthy skepticism as to the efficacy of diuretic drugs in cases of nephritis without cardiac decompensation.

D. Functional tests in relation to anatomic changes in the kidney. 1. In eighteen cases of chronic nephritis, the patients dying and coming to necropsy, no constant relations have been found between anatomic lesions and renal function in so far as excretion of phenolsulphonephthalein, albumin in the urine, casts, presence or absence of edema, blood-pressure determinations, etc., are concerned.

17. **Gangrene of Lung.**—In Head's case the diagnosis of gangrene of the lung was made by plunging a long exploring needle into the area of lung involved and withdrawing about 5 c.c. of dark-colored fluid having the typical smell of gangrene and containing cellular elements of a peculiar type. Without this evidence, Head says, the diagnosis of gangrene of the lung could not have been made, since neither the breath of the patient nor the sputum coughed up gave out an odor suggestive to gangrene.

18. **Luetin Reaction in Syphilis.**—From the study of the luetin reaction in 200 medical cases presenting themselves for diagnosis, the following conclusions are drawn by Hanes: 1. The luetin reaction when positive is absolutely specific. The author has not seen a single positive reaction in a case free from symptoms and physical signs of syphilis. 2. The reaction is of limited value in other than tertiary cases. 3. The luetin reaction is a more delicate test for latent and tertiary syphilis than is the Wassermann reaction. 4. Patients suffering with visceral syphilis give positive luetin reactions with great constancy. This seems especially true of cardiovascular syphilis. The luetin test represents a distinct advance in the diagnosis of syphilis, and is a helpful supplement to the Wassermann test in the diagnosis of tertiary syphilitic lesions.

19. **Friedländer Bacillus Pneumonia.**—The study of four cases leads Sisson and Thompson to conclude that there exists a type of lobar pneumonia, *sui generis*, that is caused by the *Bacillus mucosus capsulatus*. Clinically, this so-called "Friedländer pneumonia" is subject to great variation. The exact diagnosis is difficult to make clinically, but is aided by the identification of the Friedländer bacillus, both in the blood and sputum. The pathologic findings taken together are usually quite typical for this form of pneumonia.

20. **Acetone and Diacetic Acid.**—Bradner and Reimann found that acetone occasionally accompanied by diacetic acid was eliminated in the urine of 182 out of 214 consecutive surgical patients (in 23.3 per cent. before surgical intervention and in 61.7 per cent. after operation, under ether anesthesia). The temperament of the individual and the length of time preoperative treatment (of nothing by mouth and saline by bowel) had been carried out, appeared to have a slight positive effect on the acetone eliminated. Acetone and diacetic acid were eliminated oftener and in larger quantities in women than in men. The fact of surgery alone increased the acid, but the severity of the operation and the amount of obvious shock present had but little bearing on the amount of eliminated acid and the time of elimination.

Boston Medical and Surgical Journal
November 11, CLXXIII, No. 20, pp. 723-758

22 Legislation for Insane in Massachusetts, with Particular Reference to Voluntary Admission and Temporary Care Laws. F. E. Williams, Boston.

23 Report of Harvard University Service at American Ambulance, Lycée Pasteur, Neuilly-Sur-Seine, France. R. B. Greenough, Boston.

24 Artificial Pneumothorax. E. O. Otis, Boston.
25 State of Respiratory Mechanism in Pneumonia. J. H. Means, L. H. Newburgh and W. T. Porter, Boston.
26 Exercise in Treatment of Severe Diabetes. F. M. Allen, New York.
27 Statistics of New York State Hospitals for 1913, with Special Regard to Statistics Regarding Dementia Praecox. C. T. La Moure, Lakeville, Conn.
28 Studies in Speech Disorder. W. B. Swift, Boston.
29 Time-Saving Method for Multiple Sugar Analyses. B. H. Ragle, Boston.

Indiana State Medical Association Journal, Fort Wayne

October, VIII, No. 10, pp. 455-498

30 Relation of Endamebae to Alveolar Pyorrhea. C. C. Bass, New Orleans.
31 Pathogenesis of Spontaneous and Experimental Appendicitis, Ulcer of Stomach and Cholecystitis. E. C. Rosenow, Rochester, Minn.
32 *Position of Normal Stomach, with Observations on Movements of Diaphragm. B. D. Myers, Indianapolis.

32. Abstracted in THE JOURNAL, Oct. 24, 1914, p. 1499.

Journal of Abnormal Psychology, Boston

October-November, X, No. 4, pp. 225-296

33 Psychologic Analysis of Stuttering. W. B. Swift, Boston.
34 Origin of Supernatural Explanations. T. A. Williams, Washington, D. C.
35 Data Concerning Delusions of Personality; Association of Bright's Disease and Unpleasant Delusions. E. E. Southard, Boston.

Journal of Infectious Diseases, Chicago

November, XVII, No. 3, pp. 437-584

36 New Member of Aciduric Group of Bacilli. J. C. Torrey and A. H. Rabe, New York.
37 Proteolytic Enzyme of Bacillus Proteus. A. I. Kendall and A. W. Walker, Chicago.
38 Economical Intracutaneous Method for Testing Virulence of Diphtheria Bacilli. A. Zingher and D. Soletsky, New York.
39 Etiology of "Symptomatic Anthrax" in Swine. K. F. Meyer, San Francisco.
40 Natural Hemolysins in Normal Horse Serum. F. Boerner, Jr., Philadelphia.
41 Effect of Bacterial Metabolism on Antigenic Properties and Serologic Reactions of Bacteria. J. P. Simonds, Chicago.
42 Lesions in Experimental Infection with Bacterium Tularense. P. G. Woolley, Cincinnati.
43 Varieties of Pneumococci Causing Lobar Pneumonia, with Especial Reference to Their Biologic Differences. G. Mathers, Chicago.
44 Importation of Typhus into United States. J. L. Kantor, Syracuse.
45 Nomenclature of Coccaceae. R. E. Buchanan, Ames, Iowa.
46 Effect of Anaphylactic Shock on Cellular Reaction of Peritoneum of Guinea-Pig. F. M. Rackemann, New York.
47 Outbreak of Roup and Chickenpox in Which High Mortality was Apparently Caused by Secondary Invader. B. A. Beach, H. Lothe and J. G. Halpin, Madison, Wis.
48 *Transmission and Administrative Control of Measles. H. F. Gray, Alto, Calif.

48. **Transmission and Control of Measles.**—From a study of an epidemic of 254 cases of measles when considered in connection with recent laboratory work on the disease, Gray believes that the following conclusions are justified: The minimal period from exposure to first symptoms was 7 days; the maximal, 14 days; the average, 11 days. The minimal period from the appearance of the first symptoms to the appearance of the exanthem was one day; the maximal, 7 days; the average, 3 days. The minimal period from exposure to the appearance of the exanthem was 11 days; the maximal, 19 days; the average, 13.5 days. The distribution between the sexes was nearly equal, with a slightly greater number of males than females. The average age of cases was, in males, 7.6 years; in females, 9.5 years. The incidence was greatest in males at 6 years of age; in females at 8 years. The cases in this epidemic were generally mild in character, only one severe case being reported. There were no deaths. The rate of attack per 10,000 of population was 487 (258 cases within the city limits in 1914 for a population of 5,300). Estimating an average case fatality of 4 per cent., one might have expected about 10 deaths. That they did not occur may be attributed to the mild character of the outbreak, to a general intelligent care of the cases, and to the excellent sanitary condition of the city.

Measles may be infective as early as five days prior to the appearance of the exanthem; the appearance of the rash marks probably the height of the infectiousness of the disease; the infectivity does not extend beyond 7 days after the appearance of the rash, and is probably shorter. The experience of the New York City department of health is that the disease is probably not infective 5 days after the appearance of the rash, and the experiments on monkeys would indicate that the infectiousness ceases with the approach of convalescence. The essential points in regulations for the control of measles are: The case shall be recognized and isolated at the earliest possible moment; the premises on which the case is isolated shall be placarded; the patient shall be isolated for at least five days after the appearance of the exanthem; adults and children who have previously had the disease need not be restricted, but it is advisable to warn them as to the slight possibility of second attacks, and keep them under observation; children who have not previously had measles and who are in contact with cases, need not be restricted for seven days after contact, but should thereafter be isolated for at least ten days and carefully observed. Disinfection after measles is useless and unnecessary. Transmission of measles by third persons or fomities must be exceedingly rare, if it occurs at all.

Journal of Laboratory and Clinical Medicine, St. Louis

October, I, No. 1, pp. 1-78

49 *New Method for Production of General Analgesia and Anesthesia. D. E. Jackson, St. Louis.
50 Specific Treatment in Typhoid. F. P. Gay, Berkeley, Calif.
51 Laboratory and Clinical Examinations. G. Dock, St. Louis.
52 Probable Toxic Effects of Prolonged Administration of Parathyroid Gland. R. S. Morris, Cincinnati.
53 Precancerous Conditions of Skin. M. F. Engman, St. Louis.
54 Staining Sections of Living Tissue, Unfixed. L. B. Wilson, Rochester, Minn.
55 *Intestinal Stasis and Intestinal Intoxications. P. G. Woolley, Cincinnati.

49. **Method for Production of General Analgesia and Anesthesia.**—Jackson describes a method for the production and maintenance of prolonged general analgesia or anesthesia by means of nitrous oxid, ethyl chlorid, ether, chloroform, ethyl bromid, etc., with oxygen. The method involves a continuous process of rebreathing of the gaseous or volatilized anesthetics from which the exhaled carbon dioxid, etc., have been removed and to which oxygen is constantly added in proportions suitable to maintain the patient in a satisfactory condition. The method involves the use of special apparatus which is so arranged as to give the anesthetist complete control of every phase of the anesthesia at all times. Great care has been taken to provide safety devices. So far Jackson has had an opportunity to try this method only on animals, but there seems to be good reason to expect that in man results entirely comparable to those produced in animals may readily be obtainable. For details the original article must be consulted.

55. **Intestinal Stasis and Intestinal Intoxications.**—Woolley summarizes his paper as follows: Absorption of bacteria and other substances from an unhealthy bowel may produce serious symptoms. A surgical operation for intestinal stasis is not justifiable except as a last resort. There is no definite information in the literature to show that surgical procedures, made for intestinal stasis, have been more successful than medical (including hygienic) ones. Many cases in which symptoms are attributed to intestinal stasis are suffering from focal infections entirely outside the intestinal tract. Such infections are illustrated by pyorrhea alveolaris, chronic tonsillar infection and chronic infections of the antra and sinuses of the head.

Journal of Nervous and Mental Diseases, Lancaster, Pa.

November, XLII, No. 11, pp. 721-784

56 New Clinical Instruments for More Precise Estimation of Muscle Strength and Tendon Reflex Threshold; Clinical Myosthenometer and Reflex Liminometer. F. Tilney, Brooklyn.
57 Statistical Study of Hallucinations in Manic-Depressive Type of Psychoses. J. E. Lind, Washington, D. C.
58 Two Successfully Operated Cases of Extradural Fibroma Compressing Cord. P. Bassoe, Chicago.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

November, VII, No. 4, pp. 385-555

59 *Similarity and Synergy of Morphin and Strychnin Action. H. McGuigan and E. L. Ross, Chicago.
60 Synergism of Morphin and Scopolamins. M. I. Smith, Ann Arbor, Mich.
61 *Action of Cocain. M. Kuroda, London.
62 *Blood Flow in Patient with Double Aortic and Double Mitral Disease. L. H. Newburgh and J. H. Means, Boston.
63 Effect of Caffein on Blood Flow in Normal Human Subjects. J. H. Means and L. H. Newburgh, Boston.
64 Apparatus for Perfusion of Isolated Organs. A. N. Richards and C. K. Drinker, Philadelphia.
65 Urine Formation by Perfused Kidney; Preliminary Experiments on Action of Caffein. A. N. Richards and O. H. Plant, Philadelphia.
66 Action of Phenylethylamin on Heart. H. G. Barbour and E. M. Frankel, New Haven, Conn.
67 Response of Surviving Uterus to Morphin and Scopolamin. H. G. Barbour and N. H. Copenhaver, New Haven, Conn.
68 Action of Caffein and Epinephrin on Vagus Nerve. H. G. Barbour and S. B. Kleiner, New Haven, Conn.
69 Morphin and Scopolamin Action on Intact Uterus. H. G. Barbour, New Haven, Conn.

59. **Similarity and Synergy of Morphin.**—From the work recorded by McGuigan and Ross the following conclusions are drawn: 1. Morphin when injected intraspinally into mammals (dogs and cats) in adequate doses will produce tetanus after a latent period. Codein which is apparently not oxidized in the body will not produce tetanus. 2. Morphin when oxidized to a certain degree and injected into the spinal canal of dogs or cats, or into the lymph of frogs, will produce tetanus more quickly than unchanged morphin. Artificially oxidized codein will also produce tetanus when injected in this way. Oxidized morphin when administered otherwise than directly into the cerebrospinal fluid will not produce convulsions in mammals (dogs). The strychnin-like action of morphin is apparently due to an oxidation product which is first produced and then destroyed in the body. Differences in the rate of oxidation will explain the varied reaction in different animals.

61. **Action of Cocain.**—Kuroda found that cocain first increases the activity of unstriated muscle and then depresses it, whatever be the nature of the sympathetic control. In some instances the phase of increased activity was not observed. The action of cocain in first stimulating and then paralyzing muscle fiber (including that of the iris) is analogous to its effects on other forms of living matter, including that on sensory organs when directly applied to them.

62. **Double Aortic and Double Mitral Disease.**—Determinations of the blood flow during rest and in response to increasing amounts of muscular work in a patient with valvular heart disease are reported by Newburgh and Means. No essential differences between the cardiac and normal subject were found. In both the normal and the cardiac subject the oxygen absorption and the blood flow showed a progressive rise with increasing amounts of work. This rise in blood flow was met at first chiefly by an increase in systolic output until a maximum was reached; after that by an increase in pulse rate.

Lancet-Clinic, Cincinnati

November 6, CXIV, No. 19, pp. 407-424

70 Psychoses in Twins. P. B. Newcomb, Osawatomie, Kan.
71 Acute Middle Ear Inflammations. J. W. Murphy, Cincinnati.
72 Medical Results at Tuberculosis Dispensary in 1914. J. L. Tuechter, Cincinnati.
73 Sarcoma of Upper Jaw Symptomatically Cured by Roentgen Ray. S. Lange, Cincinnati.
74 Medicine; Profession or Trade. H. Cabot, Boston.

Maine Medical Association Journal, Portland

October, VI, No. 3, pp. 137-168

75 Physician's Long Arm in Preventive Medicine. A. J. Torsleff, Bango.
76 Cancer of Breast. W. E. Gray, Milltown, Canada.

Medical Record, New York

November 13, LXXXVIII, No. 20, pp. 815-856

77 Rheumatism and Skin. W. P. Cunningham, New York.
78 Iodid of Potassium in Syphilis. D. W. Montgomery, San Francisco.
79 Arterial Tension in Connection with Cardiac Murmurs. P. E. Tiemann, New York.
80 Traumatic Hysteria; Trauma Cause or Occasion? D. B. Hardenbergh, Middletown.
81 Etiology of Pellagra. B. W. Page, Lumberton, N. C.
82 Gastric Symptoms in Tuberculosis. L. H. Levy, New Haven, Conn.
83 Impairment and Loss of Sexual Power in Acromegaly. W. A. Boyd, Baltimore.
84 Artificial Infant Feeding. J. Epstein, Brooklyn.
85 Interesting Obstetric Case. I. Eckert, New York.

Michigan State Medical Society Journal, Grand Rapids

November, XIV, No. 11, pp. 555-596

86 Spasmophilic Convulsions in Infancy; Their Differentiation and Treatment. C. G. Grulee, Chicago.
87 Admission of Indigent Patients to University Hospital, Ann Arbor, Mich. R. Peterson, Ann Arbor.
88 Trend of Medicine Fifty Years Ago. B. R. Corbus, Grand Rapids.
89 Suppurative Ethmoiditis. S. G. Miner, Detroit.
90 *Ureteral Obstruction; Report of Unusual Case. F. C. Witter, Petoskey.
91 Relation of Hysteria to Other Diseases. T. Klingmann, Ann Arbor.

90. Abstracted in THE JOURNAL, September 25, p. 1137.

New York Medical Journal

November 13, CII, No. 20, pp. 977-1024

92 Peritonitis. J. B. Deaver and D. B. Pfeiffer, Philadelphia.
93 Indigocarmin Test. C. G. Cumston, Geneva, Switzerland.
94 Cancer Treated with Autolysin. H. S. Williams, New York.
95 Treatment of Colles' Fracture. A. E. Hoag, New York.
96 Anesthesia by Rectum in Thyroidectomy. W. Lathrop, Hazleton, Pa.
97 Case of Primary Carcinoma of Appendix. J. Goldstone, New York.
98 Clinical Teaching. M. Schulman, New York.
99 Suspected Thoracic Aneurysm with Death from Rupture. F. Griffith, New York.
100 Trachoma and Follicular Conjunctivitis. M. B. Beals, New York.

Ohio State Medical Journal, Columbus

October, XI, No. 10, pp. 605-658

101 Analgesics and Anesthetics in Labor; Their Indications and Contraindications. W. Gillespie, Cincinnati.
102 Pregnancy Complicating Tuberculosis. J. J. Thomas, Cleveland.
103 *Direct Treatment of Cerebrospinal Syphilis According to Methods of Swift and Ellis. C. L. Cummer and R. Dexter, Cleveland.
104 Extraction of Lens as Seen in Some of European Clinics. C. C. Stuart, Cleveland.
105 Amebic Bowel Infection in Ohio. W. H. Lewis, Newark.

103. **Treatment of Cerebrospinal Syphilis.**—Summarizing their work Cummer and Dexter find that they have given fifty-five intraspinous injections of serum. They have had no untoward or unfortunate results in any instance. There have been no deaths, paralyses, or bladder disturbances. With all patients but two sharp reactions have occurred following the intraspinous injections. When any form of crisis or lancinating pain has been present, the reaction has usually taken the form of an acute exacerbation of this symptom. In some instances the reaction has been of a most aggravated nature. The compensation to the patient, however, is that the greatest improvement has usually followed with those who have had the most intense reactions and conversely, they have come to expect little or slight betterment in those in whom the reactions were slight or were absent. The lymphocytosis, even when as high as 153, disappears quite promptly, after one, two or three injections. The globulin test is usually slower to disappear. In some instances, it does not clear up until much treatment has been given. As to physical findings, practically the only changes the authors have been able to detect have been restoration of sensation, when this had been impaired, disappearance or practically disappearance of Romberg's sign, increase in muscular strength, and a diminution in ataxia. In no instance have they noted pupillary reactions return to normal, nor have absent deep reflexes reappeared.

In every instance in which lancinating pains were present, they have either disappeared entirely or are so much diminished that the annoyance to the patient is comparatively slight. The striking feature is the improvement in general condition, in weight, strength and well-being. In certain instances this is partially attributable to the freedom from pain, but in other cases in which pain had not been a feature, this general betterment was noted at once. Vesical incon-

tinence in one case has been so much less frequent that it has almost ceased to be an annoyance. The sum total in five cases has been a symptomatic improvement so decided that the patients' economic efficiency is restored and they are able to do their work and enjoy life as normal people. Concluding, the authors feel that they can state fairly that the Swift-Ellis method is safe when the original technic is followed painstakingly. Persistence is necessary to secure the best results.

Oklahoma State Medical Association Journal, Muskogee

November, VIII, No. 6, pp. 185-216

106 Serum Therapy, Its Uses and Abuses. L. H. Huffman, Hobart.
107 Crippled Mothers. S. H. Landrum, Altus.
108 Obstetrics in Country Practice. F. R. Wheeler, Mannford.
109 Abdominal Cesarean Section. C. D. F. O'Hern, Tulsa.
110 Definite System for History Taking and Case Record Filing. W. D. Berry, Muskogee.

Ophthalmology, Seattle

October, XII, No. 1, pp. 1-212

111 Surgical Removal of Tarsal Cartilage and Palpebral Conjunctiva in Four Hundred and Two Cases for Prophylaxis, Present and Future Elimination and Eradication of Trachoma. D. W. White and P. C. White, Tulsa, Okla.
112 Some Clinical Studies on Trachoma Question. E. E. Edmondson, Mt. Vernon, Ill.
113 Carcinoma of Caruncle; Report of Case. P. H. Dernehl, Milwaukee.
114 Local Anesthesia in Surgery of Iris and Lens. P. de Obarrio, San Francisco.
115 Complete Left Lateral Hemianopsia with Glycosuria as Result of Slight Trauma. F. E. Woodruff, St. Louis.
116 Triple Rupture of Choroid with Iridodialysis. L. F. Appleman, Philadelphia.
117 Is Migraine Forerunner of Glaucoma? R. S. Lamb, Washington, D. C.
118 Color Testing. G. H. Taylor, New South Wales, Australia.

Providence Medical Journal

November, XVI, No. 6, pp. 293-332

119 Care of Tuberculous. J. Perkins, Providence.
120 Appendicitis. J. W. Keefe, Providence.
121 Plea for Study of Pancreatitis. J. B. McKenna, East Providence.

South Carolina Medical Association Journal, Anderson

October, XI, No. 10, pp. 304-336

122 **Control of Hemorrhage in Tonsil Enucleation.** J. W. Jervey, Greenville.
123 Ovarian Cysts; Report of Case in Which Tumor Weighed Eighty-Five Pounds. S. O. Black, Philadelphia.
124 Ether Anesthesia. W. A. Boyd, Columbia.
125 Place of Laboratory Branch in Medical Education and Practice. K. M. Lynch, Charleston.
126 Milk in Diet of Infants. D. L. Smith, Spartanburg.
127 Stone in Wharton's Duct. R. T. Ferguson, Gaffney.
128 Banti's Disease; Report of Operative Case. B. B. Steedly, Spartanburg.
129 Tubercular Meningitis. R. M. Politzer, Charleston.

Southern Medical Journal, Mobile, Ala.

November, VIII, No. 11, pp. 925-1014

130 Report on Sanitation of Guayaquil. W. C. Gorgas, Washington, D. C.
131 *Relation of Bovine Infection in Child to Clinical Tuberculosis in Adult. F. M. Pottenger, Monrovia, Calif.
132 *Treatment of Honduranian Balantidiosis. N. Barlow, Cuyamel, Honduras.
133 Importance of Cerebrospinal Fluid Examinations in Syphilis of Central Nervous System. S. R. Miller, Baltimore.
134 Hereditary Syphilis in Negro Race. N. M. Moore, Augusta, Ga.
135 What Civil Surgeon Can Do for Military Surgery in Times of Peace. J. C. Bloodgood, Baltimore.
136 One Thousand Operations for Appendicitis. W. D. Haggard, Nashville, Tenn.
137 Uses and Limitations of Blood Vessel Suturing, with Special Reference to Reversal of Circulation. J. S. Horsley, Richmond, Va.
138 Neglected Eyes; the Cost. J. F. Woodward, Norfolk, Va.
139 Laryngeal Tuberculosis. J. B. Greene, Asheville, N. C.

131. Relation of Bovine Infection in Child.—If bovine infection quiets down and remains inactive for a time, to break down in later life the same as the human infection does, it certainly does not show as a bovine infection when it does become active again. Unless transmutation occurs and the bovine bacilli of the early infection changes and becomes of the human type, Pottenger believes we are compelled to assume that bovine infections in childhood do not, except rarely, produce metastases in later life, and that, in this, they are wholly unlike human infections. The most rational explanation of the facts observed requires the acceptance of the idea of transmutation.

132. Treatment of Honduranian Balantidiosis.—The balantidiosis of Honduras, if uncomplicated by pathogenic amebae, according to Barlow, is best treated by methylene blue, 2 grains three times daily, not less than four days. If an endamebic or similar infection is also present, emetin combined with oral administration of some suitable form of ipecac will be appropriate for both infections. Especial stress is placed on the oral administration, and not less than ten days of continuous treatment. With either method, at least three thorough cleansings should be given the intestines, at the beginning, middle and end of treatment. If uncinariasis be present, thymol may be given if the patient is not debilitated.

Texas State Journal of Medicine, Fort Worth

October, XI, No. 6, pp. 313-360

140 Brain and Sinus Complications of Otitis Media, with Special Reference to Symptomatology. A. H. Andrews, Chicago.
141 Accessory Sinusitis. C. P. Schenck, Waco.
142 Case of Double Chronic Maxillary Sinusitis Complicated with Unilateral Ethmoiditis. E. M. Sykes, San Antonio.
143 Some Investigations Concerning Mysterious Form and Function of Internal and Middle Ear. W. F. Cole, Waco.
144 Excessive Bleeding at Menstrual Period. F. R. Winn, Alvin.
145 Placenta Praevia; Report of Case. T. [illegible] Hunt, Hillsboro.
146 Some Pathologic Conditions of Breasts. M. A. Wood, Houston.
147 Allergic Reactions in Pregnancy. J. H. Black, Dallas.

Wisconsin Medical Journal, Milwaukee

October, XIV, No. 5, pp. 181-220

148 *Disturbances of Central Nervous System Accompanying Pernicious Anemia; Report of Two Cases. A. W. Rogers, Oconomowoc.
149 Nose and Throat in Etiology of General Diseases. R. W. Porteus, Rochester, Minn.
150 Cystoscopy in Surgical Diseases of Bladder and Kidney. E. A. Fletcher, Milwaukee.

148. Nervous System in Pernicious Anemia.—Rogers concludes his paper as follows: It would seem that pernicious anemia was the result of a toxemia or autotoxemia acting on the tissues of the body in general, but showing a selective action for certain tissues, preferably the red blood cells and nervous tissue. Certain types of pernicious anemia, in cases in which symptoms indicating involvement of the nerve centers are first to appear, may readily be confounded with tabes, paresis, myelitis, insular sclerosis and even hysteria, the diagnosis resting with the blood examination. In cases of pernicious anemia with marked involvement of nerve tissues, the blood findings are less characteristic and, too, these cases manifest a greater tendency toward remissions, making the prognosis more favorable.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

October, XII, No. 142, pp. 289-320

1 Education of Children with Defective Vision. N. B. Harman.
2 Case of Extra-Genital Primary Chancre of Wrist. G. Pernet.
3 Case of Extensive Pigmented and Hairy Nevus with Molluscous Tumors. W. M. Smith.

British Medical Journal, London

October 23, II, No. 2860, pp. 593-628

4 *Analysis of Cases of Tetanus Treated in Home Military Hospitals. D. Bruce.
5 *Hemolytic Action of Urine in Certain Conditions. C. S. McKee.
6 Ureteral Calculus; Its Symptoms and Treatment. D. Newman.
7 Epidemic Jaundice in War-Time. S. Morita.
8 Malaria Contracted in Flanders. J. M. H. Reid and H. E. Humphrys.

4. Tetanus Treated in Home Military Hospitals.—In December, 1914, a return of cases of tetanus was called for from British home military hospitals, and an army form issued. Notes on 231 cases were sent in; of these, 98 recovered and 133 died, a mortality of 57.7 per cent. The death rate in

untreated cases is stated to be 91 per cent. in those of short incubation, 50 per cent. in those of delayed incubation. If the symptoms of tetanus appeared within ten days of receiving the wound, the mortality was 66.6 per cent.; if between the eleventh and twenty-fifth day, 39 per cent. Among the 231 cases, only 37 patients are noted as having been treated with antitetanic serum before the onset of symptoms. Of these 18 recovered and 19 died, a mortality of 51.3 per cent. The usual dose was 1,500 units, but 1,000 were given in 3,500 in 2 and 4,000 in 2 cases. The average incubation period of 17 fatal cases was thirteen days; of 15 patients which recovered 18.5 days.

Out of the total of 231 cases the number of patients treated with antitetanic serum after the onset of symptoms was 215 (93 per cent.). Sixteen patients did not receive curative treatment with antitetanic serum in England. Of these, 3 recovered and 13 died; mortality, 81.25 per cent. Of the 3 which recovered, all had been treated prophylactically in France. Of the 13 who died, 6 had been treated prophylactically in France. Of the 215 patients, 116 were treated by subcutaneous injections alone; 46 recovered, 70 died; 7 were treated by intravenous injections alone; 1 recovered, 6 died; 14 were treated by intrathecal injections alone; 8 recovered, 6 died; 17 were treated subcutaneously and intravenously; 5 recovered, 12 died; 41 were treated subcutaneously and intrathecally; 23 recovered, 18 died; 2 were treated intravenously and intrathecally; 1 recovered, 1 died; 16 were treated subcutaneously, intravenously and intrathecally; 8 recovered, 8 died; 73 were treated intrathecally with or without subcutaneous or intravenous injections; 40 recovered, 33 died. It would appear that injections of antitetanic serum into the spinal canal are more effective than subcutaneous or intravenous injections. Out of 200 cases 4 patients received 1,000 units or under; 2 recovered, 2 died; 61 received from 1,001 to 5,000 units; 24 recovered, 37 died; 50 received from 5,001 to 10,000 units; 14 recovered, 36 died; 20 received from 10,001 to 15,000 units; 12 recovered, 8 died; 19 received 15,001 to 20,000 units; 6 recovered, 13 died; 19 received from 20,001 to 30,000 units; 10 recovered, 9 died; 14 received from 30,001 to 40,000 units; 9 recovered, 5 died; 13 received from 40,001 to 147,000 units; 9 recovered, 4 died.

The main conclusion drawn by Bruce from a study of these patients treated therapeutically by antitetanic serum is that it seems highly probable that the serum has little or no effect on the course of the disease. There is a little evidence that, if the serum has any effect at all, then the intrathecal method of injection is the most effective in as large dose as possible, and repeated as often as safe and practicable as long as symptoms persist. If there is any likelihood that tetanus toxin is still being absorbed into the blood stream from the wound, then, in addition to the intrathecal injection, a further quantity of serum may be introduced intravenously and subcutaneously. In this way 3,000 to 5,000 units could be injected into the spinal canal and 10,000 to 20,000 into vein and under the skin. Thirty-three patients were treated by phenol injections; 12 patients recovered and 21 died (63.6 per cent.). Nine patients were treated with magnesium sulphate; of these 7 patients died and 2 recovered. Bruce sums up the treatment of a case of tetanus as follows: (a) Place in a quiet, darkened room under care of a sympathetic and capable nurse. (b) The best surgical treatment of the wound should be thoroughly carried out to insure the prompt and complete removal of all septic products. (c) The intrathecal injection of at least 3,000 units of antitetanic serum. At the same time 10,000 to 20,000 units may be injected intravenously and subcutaneously. This procedure to be repeated as frequently as the course of the disease seems to demand. (d) In addition to this the patient should receive sedative drugs, such as chloral or chlorbutanol in full doses.

5. **Hemolytic Action of Urine.**—A phenomenon found by McKee to be of fairly constant occurrence in certain morbid states, is here described, namely, the rapid laking of blood corpuscles by the urine. It has never been noted in the urines of normal individuals. The agent causing this hemolysis is left an open question, but there is no doubt in McKee's mind that it is not a normal constituent of the urine. Save in the case of certain strongly hemolytic alkaline urines, of which one drop sometimes causes instant laking of the blood emulsion at room temperature, the hemolytic process requires incubator temperature of 37 C. Sodium bicarbonate definitely influences the reaction in vitro, and possibly when administered to patients by mouth. This appearance of a body or bodies in urine of a more or less actively hemolytic nature, is a fairly frequent accompaniment of grave disturbances of metabolism. In severe chronic anemia the reaction is frequent, but not of daily occurrence, and after having tested and cross tested the red cells of several pernicious anemia cases, it appears that some patients' cells are much more resistant than others, but also that all are less resistant than normal cells. The reaction is obtainable in erysipelas, gout, acute rheumatic fever, advanced tuberculosis, and certain cases of syphilis. In acute rheumatic fever the urine was found to lake blood cells in all cases at some period during the course of the disease, in most cases all through the acute stage. The same has been true of severe erysipelas and streptococcal throat cases. In syphilis the reaction depended on the severity of the symptoms. In all severe burns the urine has been regularly hemolytic and has remained so until death, or recovery was well assured. In some cases of skin disease in which a large part of the skin surface has been involved, laking by the urine has been common and persistent. In two cases of phenol poisoning the urine, twenty-four hours later, was intensely hemolytic and remained so till death. In starvation the reaction appeared to depend on the severity of the symptoms. In cancer with wasting, the reaction has always, so far, been present. In septic cases also it is common.

Journal of Royal Naval Medical Service, London

October, I, No. 4, pp. 373-509

9 Report on Cerebrospinal Fever in Royal Navy. H. D. Rolleston.
10 Use of Hypochlorous Acid as Antiseptic in Naval Medical Service. H. E. R. Stephens.
11 Surgical Technic on Board Royal Naval Hospital Ship Drina. R. J. Willan.
12 Possible Recurrence of Mediterranean or Undulant Fever and Its Treatment by Sensitized Vaccines. P. W. Bassett-Smith.
13 Vital Importance of Efficient Training of Naval Ratings in First Aid. R. J. G. Parnell.
14 Mental Conditions as Observed Among Ship's Company of Battleship in War-Time. T. Beaton.

Lancet, London

October 23, II, No. 4808, pp. 901-956

15 *Cases of Tetanus Treated in Home Military Hospitals. D. Bruce.
16 Pellagra. F. M. Sandwith.
17 Treatment of Cerebrospinal Fever in Royal Navy. H. D. Rolleston.
18 Traumatic Asphyxia; Report of Case. W. W. Linington.
19 Condition of Lungs during Recovery from Chest Wounds. T. G. Brodie and J. J. Mackenzie.
20 Nystagmus and Allied Conditions. J. A. Wilson.
21 Effect of Nauheim Baths on Cardiac Conductivity and Contractility. L. T. Thorne.
22 Anesthesia (General and Spinal) for Suprapubic Prostatectomy. J. D. Mortimer.
23 Cases of Diarrhea from Gallipoli. A. E. A. Ismail.
24 Case of Tapeworm Accompanied by Hemoglobinuria. W. E. Masters.
25 Case of Complete Inversion of Uterus. C. L. Fraser.

October 30, No. 4809, pp. 957-1008

26 Wound Infections and Their Treatment. (To be continued.) A. E. Wright.
27 Case of Tetanus of Short Incubation Period (Five Days) with Recovery. R. L. Scott.
28 Four Cases of Congenital Pulmonary Stenosis. D. Martin.
29 Use of Hypertonic Saline Solution in Gynecology. C. White.
30 Three Cases of Concussion Aphasis; Treated by General Anesthesia. A. P. Procter.
31 Case of Self-Inoculation with Bacillus Aerogenes Capsulatus. K. Taylor.

15. See *British Medical Journal*, Abstract No. 4.

Quarterly Journal of Medicine, London

October, IX, No. 33, pp. 1-65

32 *Clinical Observations on Atrioventricular Rhythm. G. D. Mathewson.
33 *Case of Pancreatic Insufficiency. E. I. Spriggs and A. J. Leigh.
34 *Researches on Perfused Heart. W. Burridge.
35 Recent Researches Dealing with Typhoid and Paratyphoid Infections. A. C. Inman.

32. **Atrioventricular Rhythm.**—A case is recorded by Mathewson which displayed a rhythmic change in the mode of the heart's contraction. Graphic records showed that the beat was initiated by the sino-auricular and atrioventricular nodes alternately. A corresponding rhythmic change in the first sound and in an accompanying mitral murmur was observed on auscultation. The rate of the beat during the atrioventricular rhythm was either equal to, or slightly less than, that of the periods of normal rhythm. Observations were made on the effect produced by stimulation and depression of the controlling nerves on the heart's mode of contraction. Recurrent increase of vagal tone is suggested as a possible explanation of the alternating rhythm.

33. **Case of Pancreatic Insufficiency.**—A patient with the symptoms of chronic disease of the pancreas was under the observation of Spriggs and Leigh for twenty-one weeks, in five periods extending over eighteen months. The urine and feces were analyzed for sixty-four days, and compared with the intake of food. Trypsin could not be detected in the feces and Sahli's capsules were not digested. Diastase was present in the urine in normal amount. An average of 1,200 gm. of feces was passed in a day on admission. With the reduction of unassimilable forms of fat in the food the quantity was reduced to 800 gm. in the first period of treatment, much to the comfort of the patient. An average of 302 gm. of fat per day was lost in the motions on admission. This is higher than in any other case the authors have found recorded. From 25 to 59 per cent. of the caloric energy of the food was lost in this way. The proportion of fat in the food which was lost in the feces varied from 55 to 99 per cent. The emulsified fat of milk was much better absorbed than the fat of butter, meat or cod liver oil. The percentage absorbed was less when a large quantity of fat was given.

The proportion of the total fat in the feces which had been split, and was in the form of fatty acids and soaps, was rather more than is normal throughout, the average of fifty-four days' figures being 87 per cent. Variations in the quantity and nature of the fat did not affect fat-splitting appreciably. Nearly half the nitrogen of the food appeared in the feces. Sugar was present in the urine. At first it soon disappeared with suitable food, but each time the patient came under treatment a longer period on a restricted diet was required before the urine became sugar-free. In the intervals of treatment unsuitable food was eaten. There was no evidence of acidosis. Various ferments were used in experimental periods. All except fresh pancreas and trypsogen irritated the intestinal tract. With a proprietary trypsin preparation there was improvement in the absorption of fat, and with a tannin pancreatin compound improvement in the absorption of nitrogen. The general condition of the patient improved considerably with each period of rest and treatment.

34. **Researches on Perfused Heart.**—Burridge claims that the two muscular functions of contractile capacity and ability to contract in respect to excitation by induced shocks are entirely distinct. In every heart examined it was possible by employing potassium salts to demonstrate the presence of a certain capital stock of contractile material. This capital stock is designated C. C is a quantity varying from heart to heart, but constant in value under ordinary conditions in any particular heart. The variations in amplitude of the spontaneous contractions correspond to variations in the proportion of the total contractile material evoked by the normal stimulating agency of the blood. The majority of drugs, though they may cause great variations in spontaneous activity, do not alter the value of C. Its value seems only altered by coagulation or rigor. Two groups of phenomena are described, to each of which the term cardiac failure is applied: (a) Cases in which the amplitude of these spontaneous contractions has increased, but in which by using potassium it can be shown that the capital stock of contractile materials is undiminished—C unchanged; (b) cases in which the amplitude of the spontaneous contractions has diminished, accompanied by a corresponding diminution in the amplitude of the contraction then evoked by potassium—C diminished. The two types may be combined in any one heart. Digitalis can restore the amplitude of the spontaneous contractions toward their original value in cases of the first type only. Accordingly, it is concluded that the condition of the heart in clinical cardiac failure is of that type also.

An examination of cases of the first type shows that the failure in them results from alteration in the relation of the heart to the calcium in the solution perfusing it. Two subdivisions are found. There are: (a) cases in which the heart beats are diminished in amplitude consequent on a decreased tension of calcium in the perfusing solution, the heart itself remaining "normal"; (b) cases in which the composition of the perfusing fluid remains constant, but in which the heart itself reacts less vigorously to calcium than it did originally. The mechanism for maintaining and utilizing the cardiac reserve is suggested to be as follows: The heart has a certain capital stock of contractile material, the activity of which is evoked by the calcium of the blood. Under ordinary circumstances the relations between the heart and the blood calcium are such that the calcium evokes the activity of a certain proportion of the whole. By altering the magnitude of response of the heart to calcium a greater or less proportion of that whole is rendered active. During sympathetic stimulation a given tension of calcium can evoke the activity of greater proportion of the whole cardiac contractile material than was the case before such stimulation. In clinical cardiac failure the response of the heart to such amounts of calcium as are at present in blood is sufficient to maintain an adequate circulation. Digitalis is a drug which enables a given tension of calcium to evoke the activity of a greater proportion of the whole contractile material than is the case in its absence.

Annales de Gynécologie et d'Obstétrique, Paris

September-October, XLI, No. 5, pp. 609-668

36 *Radium Treatment of Cancer of Uterine Cervix. P. Degrais.
37 *Indications for Radium Treatment of Uterine Cancer. Fabre.
38 Is Partial Resection of Sclerous Ovaries Justified? (La résection partielle des ovaires reconnus macroscopiquement scléreux ou sclero-kystiques, est-elle justifiée au point de vue microscopique?) J. P. de Figueiredo. Commenced in No. 4. To be continued.

36. **Radium Treatment of Cancer of the Cervix.**—Degrais remarks that as the term radiotherapy is applied indiscriminately to various forms of application of radiant energy in therapeutics, it is liable to be confused with radium therapy. He suggests therefore the advantage of calling radium therapy "Curie therapy," just as we speak of Roentgen therapy, and for the same reasons. He has now had several years of experience with radium treatment, and regards it as a most valuable aid to surgery, applied after curetting or partial or total extirpation, or as a preliminary to render an inoperable growth operable. Even in the desperate cases, radium may relieve and render the condition more tolerable. The benefit from it in cases beyond the scope of surgery gives it a unique position in treatment of malignant disease. He has a number of patients who seem to be in perfect health, two, three or four years since cross-fire radium treatment of their cancers. He insists on the patients returning to be examined at regular intervals, and sometimes he gives another course of the treatment. In other cases the radium has been impotent to prevent return of the cancer. The indications and technic are discussed in detail. He always tries to utilize all the rays, with suitable filters, the cross-fire exposures including one tube in the rectum.

37. **Radium Therapy of Uterine Cancer.**—Fabre declares that in only about 25 per cent. of the cases of uterine cancer is the growth in a condition so that operative treatment can eradicate the malignant disease. Inoperable and recurring cancers should be treated exclusively with radium, operative measures in these conditions being only secondary and inadequate. On the borders of inoperability, radium may modify the growth until it can be successfully removed. Operable growths should always be removed, but even here radium therapy is important, as it tends to complete the surgical act and ward off recurrence. Ten typical cases are described in detail with the exact technic of the radium treatment applied, and the outcome.

Archives Mensuelles d'Obstét. et de Gynécologie, Paris

October, IV, No. 10, pp. 369-400

39 *Frequency of Coexistence of Myoma and Cancer in the Uterus. J. Olow.

40 *Glucuronic Acid in Urine Test of Liver Functioning in the Pregnant. (La glycuronurie de la grossesse.) R. Jean.

39. **Coexistence of Myoma and Cancer.**—Olow reviews the experiences at the gynecologic clinic of the University of Lund, Sweden. He found eight cases of malignant disease among the 205 operative cases of uterine myoma up to the year 1909. Since then eight new cases have been encountered among 154; 5.2 per cent. were thus complicated with cancer. This percentage is larger than that reported from most clinics, which he thinks is because the microscope is used more regularly at Lund than elsewhere, even when macroscopic indications of cancer are not apparent. The evidence thus presented in regard to the frequent coexistence of myoma and cancer is discussed from the standpoint of treatment of myomas. Consequently he mentions only parenthetically a number of other cases in which myomas were casually found in operating for uterine cancer. The significant fact is emphasized that in the myoma cases reported the presence of cancer had not been diagnosed in any instance before the operation, and had been suspected only in one case. In another case one ovary had been left after removal of nearly the whole of the uterus of a woman of 50, and necropsy in less than a year afterward showed a cancer that had developed from the stump of the ovary. Olow cites MacDonald's article in THE JOURNAL, 1909, liii, p. 952, accepting his conclusions. With regard to radium treatment, Olow thinks that if improvement is not promptly apparent, or symptoms recur soon afterward, operative measures should not be deferred further. The influence of radium treatment is particularly favorable on climacteric hemorrhages, and hence if conditions do not rapidly improve malignant disease is almost certain. The data cited suggest the advisability of total hysterectomy for myoma whenever conditions favor it, regardless of whether there is known cancer or not. They also suggest the advantage of removing the ovaries at the same time, when women are approaching the menopause, at least.

40. **Glucuronic Acid in the Urine During Pregnancy.**—Jean gives the simple technic for quantitative tests of glucuronuria, declaring that this should be a routine procedure in examining pregnant women. It should rank with the search for albumin and sugar, as it reflects the functioning of the liver and thus permits the discovery in time of impending insufficiency on the part of the liver.

Paris Médical

V, No. 9, pp. 165-180

41 First Treatment of Skull Wounds. (Traitement des coups de feu du crâne, dans les ambulances de l'avant.) A. Schwartz.

42 *Epidemic Tetragenemia; Thirty-Five Cases. F. Trémolières and P. Loew. Commenced in No. 5.

43 Local Steam Bath for Trophic Disturbances. L. Salignat.

44 Impressions of an Ambulance Surgeon in 1870. A. Le Dentu.

No. 10, pp. 181-196

45 A Laparotomy Service Close to the Firing Line. (Une salle d'opération sur le front.) A. Mignon.

46 Psychiatry and Legal Medicine in the Army. P. Chavigny.

47 Peritoneal Symptoms from Nonpenetrating Wounds of the Abdominal Wall; Nine Cases. J. Quénu.

Nos. 11-12, pp. 197-228

48 Prophylaxis of Cholera in the Active Army. C. Dopter.

49 Differentiation and Treatment of Diarrhea in the Active Army. Sacquépée, Burnet and Weissenbach.

50 Prophylaxis of Bacillary Dysentery. C. Dopter.

51 Prophylaxis of Typhus and Relapsing Fever. J. Renault.

52 Paratyphoid Fever. M. Labbé.

53 Cultivation of Typhoid and Paratyphoid Bacilli from the Blood. D. de la Rivière and J. Leclercq.

54 *Atypical Acute Meningitis. Lacoste and L. Boidin.

55 *Acute Meningitis Following Antityphoid Vaccination. (Démonstration de l'origine toxinique de certaines réactions puriformes aseptiques des méninges.) Moussaud and R. J. Weissenbach.

No. 13, pp. 229-244

56 After-Treatment of Wounded Nerves. (Technique de la libération des nerfs blessés.) O. Laurent.

57 Arrangement for Model Contagious Hospital in Connection with the Active Army. D. de la Rivière.

42. **Tetragenus Sepsis.**—Only one of the thirty-five patients died from the tetragenemia alone, but mixed infection seemed peculiarly grave. One patient died from tetanus; in another case the tetragenus seemed to be responsible for the flaring up of tuberculous or streptococcus processes. The pleura and lungs seem to be the favorite points where the tetragenus locates, and convalescence from the tetragenemia is long and tedious, with frequent relapses. The diagnosis was confirmed by the pronounced auto-agglutination when the patient's serum was added to a fresh culture of the microbe isolated from his blood. Clumping was marked in from half an hour to an hour and a half, while control cultures showed no change. The tetragenus is said to be a harmless dweller in the mouth, but it seems to acquire virulence under certain conditions. Forty-seven healthy men were examined in seeking for carriers, and the tetragenus was found in four. When it invades the blood and settles on the lungs and pleura, it is liable to induce pneumonia, congestion of the lungs and pleurisy of various types. In its milder forms, tetragenemia simulates influenza, and in the severe forms, typhoid and paratyphoid. Cultivation of the germ from the blood and the specific seroreaction indicate that it is a morbid entity that deserves consideration in the pathology of the troops.

54. **Atypical Meningitis.**—In three cases of meningitis with limpid spinal puncture fluid, one was tuberculous and the others the work of the Friedländer bacillus or of a paracolon bacillus. In six cases with turbid fluid only two were due to the meningococcus; in two others there was evidently an aseptic effusion. In both these cases the men suddenly developed severe headache with vomiting, pain in the spine and temperature of 40 C. (104 F.). One had herpes. Both men were given an injection of 40 c.c. of antimeningococcus serum and prompt recovery followed. Although the fluid looked turbid, yet the polynuclears were intact and the sugar and albumin were in normal proportions and there was no coagulation of fibrin, and no microbes could be cultivated from the fluid. It seems as if the meningitis in these cases must be the work of some germ not revealable by our present technics to date, but the infection, if such it be, is mild and tends toward a spontaneous cure. The series of atypical cases related were all sporadic, with no apparent connection between them except that they all occurred within a comparatively brief period.

55. **Aseptic Puriform Meningitis.**—In the case reported in detail a robust young man developed acute meningitis after his third inoculation against typhoid. Epidemic meningitis was suspected at first, but the fluid on lumbar puncture was sterile and merely puriform in aspect. Improvement was evident within twenty-four hours of the single evacuating lumbar puncture; the headache subsided, he ceased to vomit and the temperature went down. Two days later the stiffness of the neck and Kernig's sign also disappeared and lumbar puncture showed a clear fluid, normal except for a few lymphocytes. No focus of infection in the meninges or elsewhere could be discovered. It was learned later that the second antityphoid inoculation had been followed by violent headache, fever, chills and vomiting, the malaise keeping up for two days. The main differential features distinguishing the puriform from the purulent form of meningitis is that the polynuclears are intact and that the course is mild and brief. The case reported demonstrates anew that microbian toxins are able to irritate the meninges without the presence of living microbes.

Presse Médicale, Paris

October 11, XXIII, No. 48, pp. 393-400

58 *Distant Dystrophy of Muscles in the Wounded. (Sur certaines dystrophies musculaires du type myopathique consécutives aux traumatismes de guerre.) H. Claude, A. Vigouroux and J. Lhermitte.

59 Abortive Treatment of Infection in Wounds. (Traitement abortif de l'infection des plaies.) A. Carrell, Dakin and Others.

60 *Filtration of Boiled Water for Intravenous Injection. (Nouvelle simplification de la technique des injections intra-veineuses concentrées d'arséno-benzol.) P. Ravaut.

October 14, No. 49, pp. 401-408

61 *Prophylaxis and Treatment of Venereal Diseases in the Active Army. F. Balzer.

62 *The Toxins of Intestinal Worms. D. E. Paulian.

63 Ligation of Carotid Arteries. A. Broca.
64 Abortive Tetanus with Long Incubation and Protracted Evolution. H. Claude and J. Lhermitte.

October 21, No. 50, pp. 409-416

65 The Thumb Sign in Ulnar Paralysis. (La préhension dans les paralysies du nerf cubital et le signe du pouce.) J. Froment.

58. **Atrophy of Muscles in Wounded Soldiers.**—This communication refers to trophic disturbances in muscles which apparently have little or no connection with the wound. An illustrated description is given of four typical cases. The atrophy develops independent of any detectable lesion in the central or peripheral nervous system, and seems to be the result of nutritional disturbances in the muscle, primary or secondary to some reflex irritation. The men had all been wounded but at some point more or less remote from the scapular region which was the usual site of the muscular anomalies. The ultimate outcome is a question which time alone can answer.

60. **Intravenous Injections Without Distilled Water.**—Ravaut relates that distilled water is not to be had in his service near the firing line. He has found that it can be dispensed with and ordinary contaminated water used without harm, by the simple precaution of pressing the tip of the syringe down on a wad of cotton at the bottom of the dish in which the water has been boiled. By aspirating the water thus into the syringe through the thick wad of cotton, the water is effectually filtered and he makes the intravenous injection without apprehension.

61. **Prophylaxis of Venereal Diseases.**—Balzar reviews the experiences in this line in different armies during the present and other recent wars. He emphasizes the responsibility of the military medical authorities in supervision and control of sources of possible infection, in early detection of infection, and most effectual treatment. His recommendations for abortive treatment are based on his long experience at the Saint Louis Hospital in Paris. He insists that a special record must be kept by the physician of each case of gonorrhea or syphilis, and an individual record given each patient which he should present to each physician to whom he applies. These individual cards might be utilized for brief instructions and warnings as to the gravity of the disease. As models in this line he cites the bulletins issued by the Société de Prophylaxie sanitaire et morale during the last fifteen years, and Guiart's recent work, "Syphilis et blennoragie."

62. **Toxins of Helminths.**—Paulian injected guinea-pigs with alcoholic extracts of various intestinal parasites, including ascarides, oxyuris and tenia. Other tests were made with macerations of their bodies. He found evidences of severe toxic action, from congestion and hyperemia to actual degeneration of tissues, loss of resisting powers of the red corpuscles, intense anemia and eosinophilia. The nervous disturbances and even the eosinophilia may be regarded, he thinks, as phenomena of anaphylaxis. His findings confirm those reported by others except that he never detected the lesions described by Rachmanov in the nervous elements. The organs predominantly affected were the spleen, kidneys and liver, the latter showing fatty degeneration in one animal. The suprarenals were always hyperemic and with intertrabecular hemorrhages.

Berliner klinische Wochenschrift

October 18, LII, No. 42, pp. 1081-1104

66 Itching and Pain. (Jucken und Schmerz.) P. G. Unna. To be continued.
67 *Production of Bile Pigment Outside the Liver. (Ueber anhepatische Gallenfarbstoffbildung.) A. A. H. van den Bergh and I. Snapper (Groningen).
68 Standard Weight for Adults. (Die Görtner'sche Normalgewichtstabelle für Erwachsene.) G. Oeder.
69 Experiences with Infectious Diseases in Field Hospital. Grundmann. To be continued.
70 *Hard Filtered Roentgen Rays in Treatment of Skin Diseases. F. M. Meyer.

67. Practically the same article was summarized in THE JOURNAL, Sept. 4, 1915, p. 913.

70. **Filtered Hard Roentgen Rays in Treatment of Skin Diseases.**—Meyer enumerates a number of advantages from using filtered hard rays, among them the less danger of a reaction, the shorter exposures required, and that various skin affections refractory to ordinary Roentgen treatment yield to the filtered hard rays, as he describes in detail.

Correspondenz-Blatt für Schweizer Aerste, Basel

October 2, XLV, No. 40, pp. 1249-1280

71 *Treatment of Tetanus. T. Kocher.

October 9, No. 41, pp. 1281-1312

72 Blood Findings Reveal Leukemia in Puzzling Cases. (Die hämatologische Diagnostik der Leukämien.) A. Suter.
73 *Experiences with Smallpox. Tièche.

71. **Treatment of Tetanus.**—Kocher discusses some recently published cases of tetanus developing after prophylactic serotherapy and under magnesium sulphate treatment, and exonerates these two measures. In his own last three cases, the one adult died of pneumonia when the tetanus was under control. The two children were brought through safely. The tetanus was extremely severe in one of them, a boy of 10, with a six-day incubation and no antitetanus serum. Magnesium sulphate was given freely to keep the muscles constantly relaxed, first subcutaneously, then intramuscularly, to a total of 315 gm. of the sulphate, in a 25 per cent. solution, in the course of eighteen days. Kocher reiterates that the main point is to gain time, tiding the patient along until enough antibodies are produced to neutralize the tetanus toxin. The magnesium sulphate helps to tide the patient through this waiting period, and Kocher announces that by fractioning the maximal dose over the twenty-four hours it can be given for from six to eighteen days without harm. He regards his recent experiences as suggesting great progress in that they show that it is not necessary to give the full dose at one time, but that it can be distributed over the twenty-four hours, commencing with the largest fraction of the dose, and reaching the total dose of 1.5 gm. per 1 kg. weight before the close of the twenty-four hours. The severer the case, the larger the portion to be given at first, and it may be well to inject it into a vein or into the spinal canal.

He insists further that it is not necessary to give enough of the drug to relax the muscles completely; all that is necessary is to reduce the excitability of the centers to the point that the paroxysms no longer occur, even although some stiffness persists. Managed in this way, there is practically no danger of paralysis of the respiration. This is explained by Straub's discovery that the paroxysm-producing overexcitability subsides before the ability to respond to physiologic stimuli becomes paralyzed. He also comments on the cumulative action of the drug and its rapid elimination. The latter proceeds most rapidly after intravenous injection; next, after intramuscular, and most slowly after intraspinal injection. Kocher advocates prophylactic subcutaneous injection of 10 c.c. of antitetanus serum, repeated the fifth, eighth and twelfth days. If the magnesium sulphate is given by intraspinal injection he has the patient lie flat, only the head, not the neck, on a pillow. If the muscles of the trunk and chest do not relax, the head must be lowered, the whole body slanting downward. The deep narcosis which this induces is useful, but there is danger of arrest of respiration. He keeps the Meltzer apparatus beside the bed, ready to use it at the first sign of trouble, but he uses oxygen instead of air. The heart is not affected by the sulphate, and he emphasizes that the respiration stoppage is really not dangerous under proper care.

73. **Smallpox.**—Tièche relates a number of incidents from two recent visitations of variola in Swiss cantons where vaccination is not compulsory. The cases were mostly in imported laborers, but several occurred in persons who had been twice vaccinated. One unvaccinated small child developed smallpox in a building that had been used to house a few smallpox patients. The interval since the last case had been twenty-seven months, and the premises had been supposedly thoroughly disinfected at the time. His further

experience has confirmed the reliability of the skin allergy reaction in differentiating variola from varicella. (Described in THE JOURNAL, Nov. 7, 1914, p. 1702.) He relates several cases in which it proved a great convenience, definitely clearing away the suspicion of smallpox in hotel inmates or demonstrating the necessity for their immediate isolation.

Medizinische Klinik, Berlin

October 10, XI, No. 41, pp. 1119-1146

74 *Treatment of Suppurating Wounds of the Knee. (Zur Behandlung eiternder Knieschüsse.) H. Schloffer.
75 Surgical Preliminaries for a Functionally Capable Artificial Hand. (Chirurgische Vorarbeit für eine willkürlich bewegliche künstliche Hand.) F. Sauerbruch.
76 Experiences of a Surgeon During the Siege of Przemysl. R. Pamperl.
77 Importance of Dosage and Filtering in Roentgen Depilation. F. M. Meyer.
78 Simple Technic for Secondary Amputation. W. Pfeilsticker.
79 Fenestrated Plaster Casts for First Treatment of Fractures in War. (Erhebungen über die Brauchbarkeit der gefensterten Gipsverbände für die erste Behandlung der Schussfrakturen im Kriege.) C. Hempel.
80 Frame to Hold Stretchers for Operations. A. Partos.
81 First Measures in Case of Fracture. H. Spitzy and A. Hartwich. To be continued.

74. **Treatment of Suppurating Knee.**—Schloffer has been surprised by the excellent results obtained by opening up the suppurating joint, and immobilizing it held at an acute angle. He has applied this technic in eleven cases and was able to save the limb when amputation seemed otherwise unavoidable. The condition at the *Aufklappung* and the outcome later are shown in eight illustrations, and the advantages over resection are extolled. Even when bone has been shattered, resection may be restricted to removing merely the loose scraps.

Münchener medizinische Wochenschrift, Munich

October 12, LXII, No. 41, pp. 1381-1416

82 *Anaerobic Sepsis. B. O. Pribram.
83 Experiences with "Partial Antigen" Treatment of Tuberculosis. (Erste Erfahrungen mit Deycke-Muchschen Tuberkulosepartialantigenen im Hochgebirge.) W. Müller.
84 Early Exercises with Extension Dressings. (Frühmobilisierung im Zugverband.) A. Ziegler.
85 The Prothesis Question after Amputations. Spitzy.
86 Treatment of Gunshot and Shell Wounds of the Upper Arm. (Kriegsverletzungen des Oberarms.) E. v. Redwitz.
87 Mechanical Protection against Flies. (Zur Bekämpfung der Fliegengefahr.) Seelhorst.
88 Experiences in a Field Hospital. E. Sonntag. Commenced in No. 40.
89 Experiences of a Troop Medical Officer. (Erfahrungen eines Truppenarztes.) Haehner. Commenced in No. 40.
90 Roentgen Localization of Foreign Bodies, especially in Eye and Orbit. L. v. Liebermann, Jr.
91 Denunciation of Collective Inquiry on Sexual Abstinence. (Sammelforschung der Deutschen Gesellschaft zur Bekämpfung der Geschlechtskrankheiten über die Frage der sexuellen Abstinenz.) R. Schaeffer.

82. **Anaerobic Sepsis.**—Pribram found anaerobic bacteria of different kinds in the blood in some severe cases of gas phlegmon. He declares that the organism seems to be perfectly helpless against this invasion of the blood by the anaerobics, as their products cause rapid coagulation of the blood. From the finest capillaries to the larger vessels, all become plugged with thrombi, thus shutting off the oxygenated blood which would be unfavorable for the anaerobes. They can thus proliferate unmolested in the dead tissues, which amply explains the gravity of the gas phlegmon process. Even deep incisions into the region bring no blood; this is more characteristic of anaerobic infection than the production of gas. As long as anaerobes are limited to this region there are no general symptoms except the fever. But when they break into the circulation, the respiration becomes like that of diabetic coma, the blood pressure declines, the body grows cold, and death follows from gradual failing of the heart. During this phase bacteriologic tests of the blood always gave positive findings. Necropsy a few minutes after death showed the heart and coronaries full of bubbles, and in some cases the liver, kidneys and spleen were foamy—all, he thinks, the result of the production of carbon dioxid in the blood vessels. Some cases are described in detail. Pribram reiterating that there are scarcely any other bacteria against which we are so powerless as anaerobics when they have an opportunity to localize in broad masses of muscles. He adds that possibly serology may yet provide us with a weapon against them.

Wiener klinische Wochenschrift, Vienna

XXVIII, No. 36, pp. 965-992

92 Peculiar Features of War Typhoid. G. Herrnheiser.
93 *Nephrotyphoid. F. Deutsch.
94 Reaction Disturbances after Inoculation against Typhoid. M. Löwy.
95 Alimentary Toxic Polyneuritis in Mother and Daughter. G. Bikeles.
96 *Test for Urobilin in Urine and Stool. A. Edelmann.
97 Suggested Chart for Record of Action of Therapeutic Measures to Permit Comparison Better. (Vorschläge zu einer geregelten Heilstatistik.) O. Klaus.

No. 37, pp. 993-1020

98 *Motility Test for Typhoid Bacilli in Water. M. V. Carbonell.
99 Treatment of False Aneurysms. Zahradnicky.
100 Anise Oil in Treatment of Scabies. A. Perutz.

No. 38, pp. 1021-1048

101 *Detection of Tendency to Epilepsy. S. Jellinek.
102 Wounds of the Skull. (Erfolge und Misserfolge bei der operativen Behandlung der Schädelschusse.) B. O. Pribram. (Ueber Schädelschüsse.) M. Maresch.
103 Charcoal in Sterilization of Fluids. R. Kraus and B. Barbara.
104 Sources of Error in Bacteriologic Diagnosis of Dysentery. H. Egyedi and W. Kulka.
105 Gas Phlegmons. M. Cernic.
106 Inoculation of Army against Typhoid. K. Russ. Commenced in No. 37.

93. **Typhoid Nephritis.**—Deutsch relates that three persons in one house developed in turn acute nephritis with high fever. It proved to be the only local manifestation of typhoid fever. Typhoid bacilli were found numerous in the urine in one case the fourth day and also in the blood. The bacilli in all the cases were persistently serum-proof, not clumping at 1:50. The patients were children; the intervals between the cases were eleven and four weeks.

96. **Test for Urobilin in Urine and Stool.**—Edelmann's test is a modification of Schmidt's test for feces, which is based on the red pigment formed when dissolved feces are treated with a concentrated aqueous solution of mercuric chlorid. By using an alcoholic solution, he states, the reaction is much more pronounced. One of the two reagents is a 10 per cent. alcohol solution of mercuric chlorid. The other reagent is a 10 per cent. alcoholic solution of zinc chlorid and amylic alcohol. Only one or two minutes are required for the test, and its simplicity adapts it, he reiterates, for bedside use.

98. **Motility Test for Differentiating Typhoid Bacilli in Water.**—THE JOURNAL described Sept. 4, 1915, p. 908, the U tube, with sand in one side, through which motile bacteria readily make their way. The nonmotile stay in the sandless side in which they were all placed originally, while the motile typhoid bacilli make their way through the sand and proliferate above it.

101. **Detection of Tendency to Epilepsy.**—Jellinek lists the points which differentiate a true epileptic seizure from a hysteric spasm. Among them he notes that in true epilepsy the face muscles twitch predominantly while in hysteria the muscles of the trunk or limbs are most affected. With epilepsy the spasmodic movements are synchronous on one side of the body. In hysteria it is the whole of the upper part of the body or the legs alone that are mainly affected. After an epileptic seizure the individual feels prostrated and takes long to recover, while recuperation is rapid and complete after a hysteric attack. He adds that the Babinski toe sign, plantar flexion of the big toe, seems to be a reliable sign of true epilepsy. He found it constant in all his cases of epilepsy while the sign could never be elicited in any of his numerous hysteria cases.

Zeitschrift für Tuberkulose, Berlin

September, XXIV, No. 5, pp. 321-400. Last indexed Oct. 9, p. 1315

107 *Origin of Tuberculous Apical Lesions. (Betrachtungen über die Entstehung der tuberkulosen Lungenspitzenphthise. V.) C. Hart.
108 *Tuberculosis in the Active Army. (Die Tuberkulose im Heere zur Zeit des Krieges.) G. Schröder.

109 *The War and Pulmonary Tuberculosis. (Krieg und Lungentuberkulose.) H. Grau.
110 Tuberculosis in the Prisoners of War. (Die Tuberkulose der Kriegsgefangenen.) G. Liebe.

107. **Factors Leading to Apical Tuberculosis.**—Hart reviews much of the literature on this subject in this fifth article of the series. His own view is that a constitutional predisposition is the most important factor that determines the direction of the individual's fate so far as tuberculosis is concerned. The mode of life, the environment, unhygienic conditions in general breed tuberculosis only as they develop a latent into a well defined predisposition. Bacmeister contends that in children a localized and healed tuberculous focus in the lung might deform the upper aperture by muscular contraction in Pottenger's sense. Hart rejoins to this *Man soll nicht päpstlicher als der Papst sein.* Pottenger's theory presupposes a primary apical process, and this, we all know, is a great rarity in children, while in adults deformity of the aperture precedes the development of the tuberculous apical process. Hart insists that conclusions drawn from experiments on dogs cannot be applied to man. He has devised a method for experiments on monkeys which he thinks seems very promising, and he has not given up the hope that some day he may have the means to undertake research in this line. He is convinced that tubercle bacilli can exist as saprophytes in the lungs, or, as Liebreich expresses it, as nosoparasites. There may be functional, secondarily acquired and congenital factors cooperating, mechanically inducing a predisposition in the apex region for defective circulation of blood and lymph, thus providing conditions favoring localization of tubercle bacilli.

108. **Tuberculosis in the Active Army.**—Schröder remarks that the war conditions are like a laboratory experiment on a vast scale to decide certain questions as to the etiology of tuberculosis. The importance of a constitutional predisposition is exemplified again and again in the men who develop tuberculosis in active service. They all had had some tuberculous process early in life, but it had healed in time and the men were sound to all intents and purposes. Then came the war, with its tremendous demands on heart and mind, physical deprivations, powerful emotional stress, and inadequate or defectively cooked food, colds, etc. These factors are liable to rouse the latent, practically healed old foci and fan them to a flame, or start new endogenous foci elsewhere, the physical exertions of active service whipping up the circulation of blood and lymph and aiding in disseminating the germs. He knows to date of no instance of tuberculous processes developing in bones or joints in connection with external injuries, but these injuries, by lowering the resisting powers, favor metastasis.

All these factors act more potently in case of constitutional physical inferiority. On the other hand, the out-of-door life, muscular exercise and strengthening of the will power aid in combating the action of the invading germs so that in many cases the old latent foci remain latent, and the number of men developing active tuberculosis is less than might be expected. At the same time, early recognition of the flaring up of the old process and a prompt course of sanatorium treatment arrest the autoreinfection in many cases, so that there is every prospect that a not inconsiderable number of the men can be restored to the army in time. The main thing, therefore, is to distinguish between active and inactive cases, that is, those not requiring treatment. He outlines the examination necessary to determine this, including the minute inspection of all the organs, weighing the previous history, and signs of constitutional inferiority, unstable pulse, anemic heart murmurs and weak heart action, examination of the upper air passages and ears, taking the mouth temperature morning and afternoon every two hours and the temperature in the rectum before an hour's walk, after it, and again after half an hour of repose. The subcutaneous tuberculin test is not a reliable criterion as to whether a focus is active or latent, while he has seen harm result from it. The skin test is decisive for the diagnosis only when it is negative, but it may aid in the prognosis as a pronounced response to the graduated titration test, in the absence of signs of active tuberculosis, indicates a favorable prognosis. He says of tuberculin treatment that artificial production of "anergy" by no means signifies a cure of the tuberculosis, an acquiring of immunity, but rather the reverse. Individuals thus artificially rendered tuberculin-proof seemed more inclined to relapses than those not taking tuberculin. The proportion of soldiers recovering clinical health after a course of sanatorium treatment is larger than among civilians. At the Schömberg sanatorium only 3.4 per cent. of the 200 died or were dismissed as incapable of further military service.

109. **The War and Pulmonary Tuberculosis.**—Grau gives his impressions from observation of 100 tuberculous men at the Rheinland sanatorium. In two cases the men were unusually well developed but there was a suspicion of tuberculosis in the history, and after a period of exhausting overexertion both developed a febrile tuberculous process in the costal periosteum. The local process has persisted unmodified during the six months since, with occasional febrile periods. In some other cases, the inoculation against typhoid seemed to rouse a sleeping tuberculous focus, with prolonged fever afterward. In these and the rib cases the specific resisting power of the organism seems to have been unfavorably modified. A number of other interesting cases are described, the war affording typical examples of the numerous different causes that are liable to induce tuberculosis.

Pediatria, Naples

October, XXIII, No. 10, pp. 689-752

111 Connection between Rachitis and Inherited Syphilis. (Sul cosidetto "rachitismo sifilitico.) S. Mura.
112 Streptothrix Cerebrospinal Meningitis in Six-Months Infant. G. Rutelli.

Policlinico, Rome

October 10, XXII, No. 41, pp. 1365-1400

113 The Soldier's Ration. (L'alimentazione del soldato.) G. Dragotti.

October 17, No. 42, pp. 1401-1436

114 Lesions of the Nose and Accessory Cavities in War. G. Ferreri. Commenced in No. 40.
115 *Revulsion with the Actual Cautery in Treatment of Inflammatory Tuberculous Processes. (Le punte di fuoco nella terapia delle cosi dette tubercolosi infiammatorie.) A. Maffi.
116 Artificially Induced Lesions and Workmen's Compensation. (Le lesioni artificiali negli infortuni sul lavoro.) S. Diez.

October, Surgical Section, No. 10, pp. 463-500

117 Treatment of Gunshot Wounds of the Shoulder. (2 casi di ferite di arma da fuoco a pallini della spalla.) O. Cignozzi.
118 *Effectual Biochemical Action of Copper Sulphate in Treatment of Uterine Cancer. (Cancro dell' utero guarito col solfato di rame.) L. Manara.
119 Deviation of Complement Test in Echinococcus Disease in Man. L. C. Zapelloni. To be continued.
120 Mixed Tumors of the Palate. G. Morone. To be continued.

115. **The Actual Cautery in Revulsion Treatment of Inflammatory Processes.**—Maffi states that laymen in his country have an exalted opinion of the efficacy of revulsion with the actual cautery applied at numerous points over and around a long continued inflammatory process. This is also a favorite therapeutic measure of French physicians, especially in country practice. In a recent case of a tuberculous process in the knee, after failure of other measures, he yielded to the patient's insistence and applied the actual cautery at fifty points to encircle the knee. The spontaneous pain subsided at once; in forty days the patient was able to get up and in another month to walk without pain or further impairment of function. Encouraged by this experience, he has applied the measure since in all forms of what Poncet calls inflammatory tuberculosis, joint troubles, ostitis, neuralgia, synovitis, etc., and has obtained surprising effects, he relates, with revulsion in this way as an adjuvant to repose, fresh air and sunlight. He uses the ordinary thermocautery, with a blunt point, about 4 or 5 mm., and plunges it into the derma, sometimes to a depth of 1 cm. as in a case of sciatica rebellious to all other measures. After cauterization in this way at 100 different points on the buttocks and rear of the thigh, the neuralgia subsided promptly and permanently. After the cauterization he applies gauze with a little borated petrolatum. Change to a country life is always the surest means to cure in all such cases. He reiterates that this

form of revulsion with the actual cautery is always harmless and was borne perfectly even by his most sensitive patients.

118. **Copper Sulphate in Treatment of Cancer.**—Manara gives a number of views of the microscopic findings in a case of cancer of the cervix in a woman of 49. They show the varying aspect of the pus and scrapings from the cancer during a course of copper sulphate treatment, with final cure and no signs of recurrence during the months that have elapsed since. The woman had refused an operation and treatment was merely a daily intramuscular injection in the buttocks of a 1 per cent. solution of ammoniacal copper sulphate in distilled water. He relates that the glycogen in the neoplasm transforms the copper sulphate reaching it, into copper oxid. Under the caustic action of this copper oxid the cancer tissues swell and break down into an amorphous mass. This arrests the growth of the cancer which thus becomes transformed into an afebrile, mild inflammatory process which gradually heals. The course of these changes can be traced in the microscopic findings reproduced in the typical cases reported, all of which confirms his previous announcements on the subject. Cancer elsewhere than in the uterus is less protected against injury from without or from digestive juices, etc., so to date he commends the copper sulphate treatment only for uterine cancers.

Riforma Medica, Naples

October 9, XXXI, No. 41, pp. 1121-1148

121 *Successful Use of Quinin in Mild Protracted Fevers. (La cura chininica delle febbricole.) G. Rummo and L. Ferrannini.
122 Congenital Hernia of the Diaphragm. C. Volpe.
123 Pneumococcus Empyema and Peritonitis. L. Della Valle.

121. **Quinin in Chronic Mild Fever.**—Rummo and Ferrannini refer to cases that seem to be common in Italy in which the temperature runs up a trifle above normal at some time in the day, and this keeps up for weeks or months. When tuberculosis and syphilis can be excluded, they have found that a large dose of quinin by the mouth for a ten-day period restores the temperature permanently to normal in 80 or 90 per cent. of the cases. There does not seem to be any specific effect from the quinin but merely an antiseptic and antitoxic influence on the blood, which exerts an unfavorable action on all micro-organisms with which it comes in contact. Test tube experiments confirm the inhibiting influence of quinin on development of the colon and paratyphoid bacilli and others. A few typical instances of what they call "*febbricole*" are described showing the effectual action of the quinin, with a few refractory cases. Among the latter are two women who have had abnormally high temperature during part of the day, as a rule, for eight or nine years. Serologic tests have been constantly negative and several courses of quinin have not modified the temperature in any way. The daily dose is 1 or 1.5 gm., fractioned, taken while the temperature is at its lowest range. If one course is not effectual, they repeat it after a pause of four or five days. If three of these courses fail they accept the case as refractory and cease to push the quinin. The functioning of the kidneys and liver must be carefully supervised throughout.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

September 28, II, No. 13, pp. 1559-1646

124 *Research on Phagocytosis Suggests an Explanation of Certain Features of Chloroform Anesthesia. (Verklaring van het excitatiestadium der chloroformnarcose in verband met onderzoekingen over phagocytose.) H. J. Hamburger.
125 *Conjunctivitis Probably Part of Clinical Picture of Foot-and-Mouth Disease in Young Man. (Een geval van mond- en klauwzeer met oogverschijnselen?) L. A. Faber, Jr.

October 2, No. 14, pp. 1647-1726

126 *Importance for Diagnosis and Prognosis of Retention of Nitrogen in Chronic Nephritis. (Over stikstofretentie bij chronische nephritis.) R. R. Rochat and M. Hijmans.
127 *Clinical Importance of the "Urea Index" in Chronic Kidney Disease. (De klinische waarde van de onderzoekingsmethoden volgens Widal-Ambard bij chronisch nierlijden.) D. Klinkert. Commenced in No. 13.
128 Disturbance in Executing Volitional Movements. (Over sommige stoornissen in de uitvoering van eenvoudige, willekeurige bewegingen.) W. Van Woerkom. Commenced in No. 12.
129 Mucilaginous Seeds to Combat Constipation, especially Plantain Seeds. (Het zaad von plantago major als afvoermiddel.) H. and J. Pinkhof.
130 Recurrence of Quartan Malarial Fever after Intermission of Forty-Two Years. L. van der Heiden.

124. **Factors Causing Agitation Phase in Chloroform Anesthesia.**—Hamburger has been studying the process of phagocytosis as influenced by drugs. He mixed fine charcoal or sawdust with leukocytes in salt solution and counted the number of leukocytes that had incorporated the foreign particles, counting them before and again after a drug had been added to the suspension of leukocytes. In this simple way he was able to sift out the drugs that promoted from those that depressed phagocytosis. Minute quantities of calcium always augmented phagocytosis, suggesting the use of calcium in treating wounds. Iodoform has a similar influence, but iodin checks phagocytosis abruptly. Iodoform and likewise chloroform and all other substances tested which dissolve fats, lipoid substances, all have a pronounced accelerating influence on phagocytosis when in very dilute solutions. The results of recent research indicate that the outer layer of certain cells consists of a lipoid substance. As the drugs of this class, including chloroform and benzol, dissolve this lipoid coating, the ameboid movements are facilitated, and phagocytosis is thus promoted. When the drug in question is in a stronger solution, then it does more than merely dissolve the outer coating of the cell; it gets inside and acts on the body of the cell, paralyzing it, and hence all ameboid movements cease, and phagocytosis is completely arrested.

Hamburger tested further whether the presence of oxygen had an influence on these phenomena, and found to his surprise that phagocytosis was most pronounced the less oxygen present. Study of this phenomenon revealed its close analogy with the behavior of the functioning of the respiration center. The latter is stimulated by carbon dioxid and depressed by oxygen. When respiration is impeded, the oxygen content of the blood becomes low and thus also the amount of oxygen reaching the respiration center; the latter under the influence of this becomes stimulated above the normal conditions. The circumstances are thus like the acceleration of phagocytosis, and in both conditions, the stimulation carried too far forces the cell and the respiration center to excessive functioning, which leads to paralysis in time—the respiration center ceasing to work. The functioning of the respiration is thus shown to be not a special phenomenon, but a general property common to all nerve cells.

It is possible that the vomiting center might be influenced by inhalation of oxygen; deep breathing alone might bring sufficient oxygen to depress the functioning of the vomiting center and thus arrest the tendency to vomit. Experiments with potassium cyanid showed that this also stimulates both the respiration center and phagocytosis, probably because it prevents them from getting the oxygen present, and thus acts like deprival of oxygen by other means. Carbon dioxid also affects the respiration and phagocytosis in the same way, first stimulating and then forcing the stimulation to excess and consequent paralysis. It is possible that this may explain in part the benefit from Bier's stasis hyperemia. The higher nerve centers probably feel the effects of deprivation of oxygen, the same as other cells, and they are thus stimulated to extra functioning when oxygen is shut off. This is what happens when chloroform is given. When the patient has inhaled a little, at the very beginning of the anesthetization, the small amount of chloroform thus taken checks the gas interchanges, thus shuts off the oxygen supply to the brain cells, and they are stimulated to extra functioning. This is manifested clinically by the phase of agitation. Then the overstimulation brings paralysis, and we say the anesthesia is complete. In conclusion, Hamburger describes what he calls "endochemotaxis," which explains the mechanism of ameboid movements in general.

125. **Foot-and-Mouth Disease in Man Involving the Eyes.**—The young man applied for treatment because vision had become impaired in the last twenty-four hours, and there was a feeling of oppression over the eyes. Otherwise he felt well, but vision was 1:100 and 1:60 in the right and left eyes, respectively. The fundus seemed normal the first

day, but the next day showed some congestion in the retinal vessels. Glasses brought no improvement in vision. The ophthalmologist ascribed the disturbances to the fact that the young man had been doing some work with a benzin flame. Fever and a chill developed the day after the disturbance in vision was noted, and during the following week lesions developed in the mouth and on the soles suggesting foot-and-mouth disease, as also on the genital organs. There was no fever after the first day, but conjunctivitis and iritis developed, and by the twenty-third day vision was still only 1:3, and embolic foci were evident in the fundus; no leukocytosis, no eosinophilia, no Wassermann reaction. The mouth lesions had not entirely retrogressed and there was still some conjunctivitis the fourth week. By the end of the second month, vision was normal and there were no further symptoms. The only trace of the trouble left was a slight tendency to night blindness. Some cases of foot-and-mouth disease in cattle were known in the district. The young man never drank raw milk but, being a coppersmith, he mended milk cans. Others have reported involvement of the genital region in foot-and-mouth disease, but Faber knows of no case on record with involvement of the eyes, and he is not positive as to whether this was the correct diagnosis in his case. The blisters burst and ulcerated. The lesions on the feet and hands were all below the ankle and wrist.

126. **Retention of Nitrogen in Chronic Nephritis.**—Rochat and Hijmans have been investigating the urea content of the blood in 110 persons with healthy kidneys, as they describe in detail. The range was from 0.117 to 0.667. Computed by Ambard's formula, the range in 112 persons was below 0.09. Accepting 1.00 as the standard in health, not one of the healthy subjects surpassed this, while the patients with chronic kidney disease always gave a much higher figure, and the increasing urea content was always paralleled by aggravation of the clinical symptoms. The discovery of a high urea content often cleared up a puzzling diagnosis, before any definite symptoms of uremia became apparent. A number of experiences are related, all confirming the simplicity and reliability of the Ambard formula for sifting out the cases of kidney disease with retention of salt. This gives the clue to treatment and saves inflicting useless restrictions on the patients. With retention of nitrogen, of course, nitrogenous food should be restricted and the calories supplied in other ways. He lists for comparison some of the more common foods showing that 100 gm. each of sugar and butter represent 400 and 786 calories with no albumin; 100 gm. rice and bread, 253 and 235 calories with 7 gm. albumin; while 299 gm. potatoes represent 276 calories with 6 gm. albumin; 200 gm. green vegetables, 6 calories with 5 gm. albumin; 50 gm. meat, on the other hand, has 10 gm. albumin to 66 calories. Ambard's formula and the bases for it have been described in THE JOURNAL; one communication on the subject was published March 7, 1914, p. 813.

127. **The Ambard Formula in Chronic Kidney Disease.**—Klinkert reports fourteen cases of chronic nephritis in which the course was traced with Ambard's formula (see preceding abstract). Three of the patients were men of 24 or 30 with albuminuria, but the Ambard formula showed constantly normal figures for the urea index, and the course of the cases confirmed the assumption that there was merely a tendency to orthostatic albuminuria. When a normal Ambard index is confirmed by a normal response to the test ingestion of 20 mg. urea on a test diet, the suspicion of chronic kidney disease, even in its earliest incipiency, is rendered untenable. In three other cases the Ambard formula warned of impending danger and by dietetic restrictions based thereon the danger was averted, the headaches cured and the Ambard index brought to normal.

The value of the blood-urea index seems to be confirmed anew by the fifteen cases related. There is retention of nitrogen in all forms of uremia, and although the patient may seem not to be incommoded by it, yet his life hangs by a thread unless the diet is regulated to keep down the nitrogen to a low point and thus leave little to be retained. The urea content of the blood is thus reduced and the patient's symptoms improve as a rule, but not invariably. Uremic poisoning is not a simple quantitative retention; it is probably above all a qualitative dyscrasia. How otherwise, he remarks, can we explain the polyuria, pruritus, etc., liable to develop before, with our best tests, we are able to detect any quantitative increase of the urea content. The retina mirrors the true condition and especially the improvement on an appropriate diet. This can be counted on most regularly in cases with not over 1.5 gm. urea. In all cases, however, he urges that the restriction of albumin must not be too rigid as this is liable to do more harm than good. By taking into consideration the general physical and psychic condition, along with the Ambard index, he thinks that it will be found an important aid in guidance of the different cases. It at least gives us a railing to hold by where, till now, we have been groping in the dark.

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October 6, LVIII, No. 40, pp. 1015-1046

131 *Achylia and Anemia with Chronic Polyarthritis. G. V. T. Borries.
132 Interchanges in Air in Human Lungs. (Om Blanding af Luft i Menneskets Lunger. Forsøg og Kritik.) A. Krogh and J. Lindhard.

October 13, No. 41, pp. 1047-1074

133 *Treatment of Postoperative Parotitis. S. Muller.
134 Atypical Form of Paroxysmal Hemoglobinuria. (Tilfælde af Marchhæmoglobinuri.) A. Sabroe.

131. **Achylia and Anemia with Chronic Polyarthritis.**—Borries quotes from recent textbooks which state that the internal organs almost always functionate normally with chronic joint disease. Appetite and digestion keep good, except for the frequent tendency to habitual constipation. This statement is the more remarkable, he says, because fully six years before Mering's 1913 manual, and even before Strümpel's were published, Faber and Lange had published four cases of achylia with chronic polyarthritis, and later had encountered it in 50 per cent. of 28 cases, and in 23 per cent. of a still later series of 65 cases (1913). Anemia was evident in 9 per cent. Borries' experiences confirm this frequency of disturbance in stomach functioning and blood production, as he relates in detail. In chronic polyarthritis (gonorrheal or syphilitic origin excluded) in 84 patients under 50, achylia was pronounced in 30 per cent. Including the 21 patients between 50 and 60, the proportion was 37 per cent. These figures become more significant when it is learned that the achylia was found in 15 per cent. of the 40 cases in which the joint trouble was of less than two years' duration; in 33 per cent. of the 39 of up to eight years' duration, and in 60 per cent. of the 15 of from eight to thirty years' duration. Achylia thus was evident in 30 per cent. of the total 94 cases. Anemia was evident in about 20 per cent.; it is secondary but may reach high proportions.

133. **Postoperative Parotitis.**—Eleven cases are described by Müller who emphasizes the necessity for evacuating massage if pus is found in Stenson's duct, as this indicates an ascending affection. If no pus emerges from Stenson's duct on light pressure of the parotid gland and its outlet, massage is contra-indicated—there being then no reason to suspect metastatic parotitis. In one such case the primary trouble was in the scapula and the parotid swelled but no pus could be expressed. Finally, after four days, pus emerged but the patient then was practically moribund from pyemia. The duration of the parotitis in the other cases treated with massage was from three to eleven days, and no phlegmon developed in any instance. In the 5 cases in which massage had not been applied, a phlegmon developed in two, and the process lasted over three weeks in 2, for eighteen days on the right and fifteen days on the left side in one case, but in another case the whole trouble subsided harmlessly in five days under moist heat.

Ugeskrift for Læger, Copenhagen

October 7, LXXVII, No. 40, pp. 1571-1598

135 Roentgen Treatment of Metrorrhagia and Fibroma; Sixty Cases. H. J. Panner and S. Kjærgaard.

October 14, No. 41, pp. 1599-1638

136 Striking Benefit in Pernicious Anemia under Kefir. (Om Anvendelsen af Kefir ved Anæmia perniciosa.) S. Kemp.